American Anthropologist

NEW SERIES

VOL. I JANUARY, 1899 NO. I

ESTHETOLOGY, OR THE SCIENCE OF ACTIVITIES DESIGNED TO GIVE PLEASURE

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INTRODUCTION

Qualities arise out of the properties of bodies when they are considered in relation to human purposes. To understand this declaration it is necessary to consider the essentials of properties and qualities and carefully to note the distinction between them. The essentials of the properties are unity, extension, speed, persistence, and consciousness, which, under relations, give rise to properties that can be measured. These properties are number, space, motion, time, and judgment.

Number is many in one, and the enumeration of the many is the measuring of the number contained in the sum which is a unity. Number, therefore, is many in one.

The second property is space; its essential is extension, but many extensions give rise to relative position, and the positions can be measured. Hence extension and position constitute space, and space is a property that can be measured.

Speed is the essential of motion, but the same particle in motion traverses a path. Motion, therefore, is speed and path,

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and can be measured in terms of space. Speed and path constitute motion.

The essential of time is persistence, but the relation of time is change; change may be measured in terms of motion. Persistence and change constitute time, and time is a property.

The essential of judgment is consciousness of self. Its relation to others is inference about another. This inference about a property can be measured in terms of that property. Consciousness and inference produce judgment. It is always the relational element of a property that can be measured.

As the essentials are developed into mathematical properties, so again the mathematical properties are developed by incorporation into classific properties through another degree of relativity. In the development of number into class, unity becomes kind and plurality becomes series. In the development of space into form, extension becomes figure and position becomes structure. In the development of motion into force, speeds becomes velocity and path becomes inertia. In the development of time into causation, persistence becomes state and change becomes event. In the development of judgment into conception, consciousness becomes recollection and inference becomes conception. Hence the classific properties are class, form, force, causation, and conception.

There are thus five essentials, and each one produces two reciprocal properties: Unity produces number and class, extension produces space and form, speed produces motion and force, persistence produces time and causation, consciousness produces judgment and conception. The mathematical properties and the classific properties are reciprocal in this: that they are two aspects of the same thing, each one postulating the other. These are the properties found in all bodies of the universe—molecular, molar, and stellar alike.

For the doctrine of properties here set forth the reader is referred to a previous publication bearing the title *Truth and*

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Error, or the Science of Intellection, where he will find these propositions demonstrated.

There are still other relations which bodies bear to one another. All the bodies of the universe have relation to human beings which are good or evil. These relations constitute another grade of relativity and are qualities. The properties give rise to qualities, for every property may produce a quality when it is considered in relation to human purposes. A number may be few or many for a purpose. Ten cents may be few if we desire to purchase a dozen oranges, but ten cents may be many when we desire to purchase but two; yet the property remains the same. A thousand dollars may be few if we desire to purchase a farm, or many if we desire to purchase a coat; but the property remains the same. A pane of glass may be small if we desire to use it in an exhibition window, or it may be large if we desire to use it in a carriage; but the property remains the same. A stone may be small if we use it in the foundation of a house, and it may be large if we wish to throw it as a missile; but the property remains the same. An hour seems a short time when I am thinking about a journey to California, but seems a long time to endure pain; yet the property remains the same. The fall of a spark from a passing engine seems but a trivial cause when I consider the soiling of my garment, but it seems to be an important cause when I consider it as igniting a forest fire; yet the property remains the same. An earthquake seems to produce but a slight effect when I observe it simply as a tremor, but when I consider it in the ruin of a city it appears to have a stupendous effect, though the property remains the same. I see a man slyly approaching a wall, and believe him to be a thief, and I have a judgment of evil; if I know that he intends to scale the wall in defense of his country, I believe him to be patriotic and brave: thus the same act may be cowardly and vile or patriotic and brave from different points of view.

Properties belong to things in themselves, but qualities exist

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in the mind as properties are viewed in relation to human designs. Qualities are relations, and the terms of the relation are properties on the one hand and purposes on the other. Now, we cannot expunge either of these terms without expunging the relation. We may not overtly consider the terms, but consider only the relation as an abstraction. Then the terms must be implied, for there is no quality unless there is an external property and an internal purpose. When properties are considered as qualities in their relation to human purposes, the judgments formed are judgments of good and evil. The judgments which men form of good and evil give rise to a multitude of human activities which are known as the arts. Those activities which are put forth to secure pleasure and to avoid pain are esthetic arts, and the science of the esthetic arts is Esthetology.

We discover the properties of things as causes through our senses, and we discover the effect of these properties on ourselves through our feelings. One term of the relation, therefore, is discovered by making intellectual judgments; the other term is discovered by making emotional judgments.

Of the judgments of truth and error I have treated in the work previously cited; the judgments of good and evil constitute the theme of the present article. In order that we may set forth the characteristics of these judgments, it becomes necessary to set forth the characteristics of the art activities in which men engage for the purpose of securing good and avoiding evil.

AMBROSIAL PLEASURES

Pleasures arise as demotic arts when they are designed to please others—the people. A lad may play ball for his own pleasure; but the professional ballplayer plays for others, his own immediate purpose being gain or welfare. This distinction must be kept in view: Pleasures are first egoistic, but soon become altruistic. When they become altruistic as pleasures they become egoistic as industries.

The metabolic sense is the sense of taste and smell, these being varieties of one sense. While yet in the animal state, man learns to enjoy the ambrosial senses in partaking of food and drink and in inhaling the air laden with many particles given off by natural bodies; but in passing into the human state, man invents a multiplicity of devices for making his food, drink, and the air which he breathes pleasurable. All ambrosial pleasures are developed by experience, but the process of enhancing pleasures has its antithesis in the evolution of pain; hence many pleasures and their antitheses, pains, have been evolved during the historic period. Without entering into a systematic treatment of the subject, it may be well to illustrate this statement as the facts are shown in individual experience and in the history of peoples.

When the uninitiated person first attempts to use tobacco in any form, it is unpleasant or even loathsome; but gradually by experience he learns to tolerate it and finally to enjoy it. If its use was universal with men, women, and children, it cannot be doubted that an hereditary love of tobacco would be developed, and thus the taste of tobacco would become innate and the judgment of its pleasant effects would be intuitive. Its extensive use seems to indicate a tendency to an hereditary love of tobacco used in one or another of the customary methods, although the period for which it has been used dates no farther back than the discovery of America. That which we wish to emphasize in this place is that the pleasure derived from the usage is artificial and is developed by experience, and that while new pleasures originate, antithetic pains arise by the development of an appetite which, ungratified, is pain.

If we contemplate the use of intoxicant beverages, like facts appear, for it is found that pleasures of the inebriating beverage must be developed by experience, and again it is found that the love of these bacchanalian pleasures has a tendency to become hereditary and to engender an appetite that produces pain. In

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the case of alcoholic beverages the tendency to inherit the taste is more fully developed than in the case of tobacco, and the taste has thus certainly become intuitive.

The love of the taste of some kinds of food of which man partakes and with which he has had experience for untold generations, seems to be hereditary and hence intuitive. The pleasure derived from the sipidity of honey, sugar, and juices of fruits is innate from experience dating back to primordial life, for the evidence is at hand that all of these ambrosial pleasures are derived and can easily be lost.

Pleasure may easily be transformed into pain. The attar of rose is a pleasant odor intuitive from hereditary experience, yet it is within the experience of the writer that it may become loathsome. Once on a time an epidemic of cholera was carrying off its victims, and he attended many men, women, and children in the last sad office of life. It was midsummer, and raging heat prevailed, so rosewater was freely used until at last it became disgusting to him and has remained so, although gradually wearing away in later years.

Thus, when we consider that hereditary and innate pleasures may be transmitted into pains, and that new pleasures may be derived from old pains, the argument for the derivation of pain is in such cases made plain. Ambrosial pleasures and pains are artificial, and no insignificant portion of human activity is occupied in catering thereto.

The nature of ambrosial pleasures and pains and the activities which arise therefrom have been sufficiently set forth for the purpose of recognizing the group.

DECORATIVE PLEASURES

In science antithetic meanings are sometimes embraced in one term; thus degrees of plus or minus from a particular datum point are combined and their sum is expressed in one term. This practice will be found convenient in the science of psychology

and in all of the sciences of human activities. I shall therefore sometimes speak of pleasure and pain in terms of pleasure implying the antithetic term pain. Sometimes we have a word which has the force of its etymologic significance and also of its antithesis. "Welfare" is a word of this character.

Pleasures are teleologic; that is, they are potent motives for human activities. There is a group of activities produced by forms which result from pleasures. These may be denominated the pleasures of form from the standpoint of motive, or the arts of decoration from the standpoint of activities. Because there are pleasures of form there are activities of decoration, and hence there are arts of decoration.

Many activities produce objects solely to gratify the feelings of pleasure. Many activities are induced primarily by other motives and secondarily by pleasure. In the production of these objects, thought and labor are expended over and above the amount necessary to produce the object for utility in order that it may give pleasure, and if it does not give this additional pleasure it gives pain. Decorative activities are often of this character. An ornament may be designed wholly for decoration, as when jewels are worn; but a garment may have its chief purpose in utility, though a secondary purpose in ornamentation, and the form and color of the garment may be considered as having an importance almost equal to that derived from its utility.

Man is rarely content with utility, but he also desires pleasure from the objects which are produced through his activities. In both classes of endeavor the decorative arts are involved. The decorative arts are arts of form.

Architectural structures are designed primarily for a utilitarian purpose, but they are decorated. Vehicles have utilitarian purposes, yet many devices of decoration are used in their construction in order that they may be pleasing. Such illustrations serve to show the general nature of the decorative arts.

Primordially form is discovered by the sense of touch; but with

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the development of vision, form is interpreted from symbols of color expressed in hue and tint. The form learned by vision is the form which is first learned by touch, but subsequently interpreted by vision, which assumes, through the agency of experience, that certain arrangements of light imply that the object must have certain adjustment of figure. The light reflected from the object impinges upon the eye and becomes a mark or symbol of the figure as primarily learned by touch—not that the particular object seen is first touched, but that the elements of form which it presents were first discovered by touch. Thus, vision becomes a vicarious sense for touch. Vision is deft, performing not only its fundamental function in the discernment of color, but instantaneously and skilfully it performs all the offices of touch in the discovery of form.

Here we have abundant evidence of the derivative nature of the decorative pleasures. By a course of experience, that which in infancy is unattractive, in maturer years becomes pleasurable; but more, that which is beautiful in childhood may become ugly in age, and that which was ugly in childhood may become beautiful in age. If the appeal is made to individual experience, all will testify to the derivative or evolutional nature of pleasures and pains. The history of decoration is loaded with lessons. That which is beautiful in savagery is unattractive or positively ugly in modern culture, while that which is unattractive among the lower races of mankind may often appear as exquisitely beautiful in higher culture. That which we especially wish to note is that decorative pleasures and pains become intuitive by hereditary transmission, and these intuitive pleasures and pains may be transformed in the individual and the race. Our judgments of pleasure and pain depend on the point of view from which properties are contemplated. There is nothing in form itself to make it beautiful or ugly, but the form becomes beautiful or ugly through the agency of experience, by which certain forms are found to be desirable or undesirable as the case may be. A con-

stant cognition of such forms will produce a habit of forming judgments of beauty about them which ultimately become intuitive. Color becomes the symbol of form because color is on the surface and is indicative of surface and thus expresses figure; but there is nothing in colors themselves which makes them either beautiful or ugly. Every color is beautiful when it seems appropriate; every color is ugly when it seems inappropriate. Particular colors seem to be particularly beautiful because we have associated them with particularly beautiful things, while the very same colors will be considered particularly ugly when they recall things which we conceive to be ugly. Form or the symbol of form is beautiful or ugly only when it produces in the mind that effect by reason of the standpoint of the perceiver; that is, properties have not qualities in themselves, but qualities arise when we consider properties in relation to purposes.

With the sense of vision, the human mind having come to a knowledge of its power in transforming the environment by minute increments, gradually so transforms it for the pleasures of decoration. Exercising activities in making artificial transformations, human beings develop the sense of the beautiful and the ugly in qualities of art and transfer them to the properties of nature. In the evolution of decoration everywhere we find that it proceeds by degree of organization, that is, by the differentiation and integration of its elements. This is beautifully illustrated in architecture, where a monotonous multiplication of like elements is replaced by figures of differentiated elements. No longer is a uniform façade recognized as beautiful, but a variety of features in a variety of elements must be presented in order that a temple, a mart, an executive building, or a business structure may be considered as a pleasing example of architecture. Variety is now considered one of the essential elements of beauty.

ATHLETIC PLEASURES

In the esthetic arts we have to consider the pleasure derived from physical activity. In these arts appeal is made to the mus-

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cular sense. The new-born beast and the new-born babe inherit more activity than is demanded for bare existence. Subject to the care of its elders, the infant is not called on for industrial activity, for its physical wants are supplied by others. While it is yet gaining its powers for utility, they are trained and expanded for pleasure. So the whelps of the lion play in the jungle, the fawns of the stag are gleeful in the glade, and lads and lassies are merry when they join in the dance.

A controversy has grown up in relation to those athletic plays which are here called sports, for we distinguish sports from another group of plays of which we are to treat hereafter as games. Sports are athletic activities, games are intellectual activities; sports develop from mimicry to rivalry, games develop from dependence on sorcery for success to dependence on skill for success. Now, if we understand the distinction between sports and games we are better prepared to understand the nature of sports themselves. Sports and games alike are activities, and the distinction which we draw between energy and activity has been set forth in the work to which reference has already been given; but an additional remark has now to be made.

Activity is that form of force which is controlled or directed by the mind, while energy is a form of force which is controlled or directed by another form of force, which is also energy. Energy involves action and passion as well as action and reaction. Action and passion are phenomena of force; action and reaction are phenomena of causation, action being cause and reaction being effect. In energy two or more bodies external to one another impinge upon one another and produce changes in one another. In activity one body has its path directed by the internal collision of its particles; activity is thus inherent only in animal bodies in which metabolism is controlled by the mind in such manner that the body itself may change its own path. The body itself has a degree of freedom to move to and fro in its hierarchal path by its own initiative. A stone cannot move from the hill to the valley

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unless it is acted on by some other external force, when both the external body and the stone itself will have their paths changed; but the animal body may pass from the hill to the valley and back again by its own initiative, not that it can add energy to itself or subtract energy from itself; it cannot create or annihilate motion, but it can direct this motion in a path at will; it can pursue the path of its own choice. All this has been set forth fully in the former work.

All activities are controlled by motives, and the motive for sport is pleasure; but it is a pleasure of a particular kind—it is a pleasure in physical activity. Now, we must notice that it is the pleasure of the body whose structure and metabolism are inherited from its ancestors; hence it must be some kind of an activity consistent with the inherited structure. So far, then, the activity is fixed by inheritance, but within these fixed limits there is still great variety of activities from which to choose. What activity will the infant choose? Manifestly it will choose that activity which is suggested by its acts of psychosis as they are developed immediately after birth, and perhaps to some extent from prenatal activities which we may not here stop to consider. The first activities which the infant animal observes, if he belongs to any of the higher groups, is the activity of parents. Thus, the infant child makes judgments about parental activities, and by the law of genesis first strives to engage in the activities which it sees in the parents. Having supplied its wants for food, this food itself produces metabolic processes which ramify through its organ in excess of the amount necessary for digestion. With its inheritance of organization and superabundance of metabolic activity, it is ready to engage in other activities which are first taught by the parent as activities of nurture, and the infant is thus led to engage in mimetic activities. Connate with these are the activities of metabolism itself, the seizing, swallowing, and digestion of food; but the additional activities in which it engages are mimetic. Hence it is that a long succession of great scholars

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have fully appreciated that sports depend on a superabundance of activity.

The plays of childhood are organized gradually to mimic the activities of elders. Kittens are trained by their mothers to play at catching mice, and puppies are trained by their mothers to play in mimic battle. Puppy wolves play at prowling, and kitten panthers play at fisticuffs. Kids play in racing, and nestling birds play in mimic flight. This universal instinct for play is exhibited in man through many years, in childhood on well into adult life. Athletic sports are universal alike in tribal and in national society. So sports of mimicry gradually develop into sports of rivalry.

Is the pleasure of sports a property of the activity, or is it a quality which depends on the point of view of the person engaged as well as the looker-on? It is within the experience of every normal human being that these pleasures grow and decay; but some are ephemeral and pass away in childhood, others pass away in youth, and still others pass away in adult age, while some undeveloped in childhood scarcely develop in youth, continue and grow in old age. Appealing to history, we discover that ephemeral pleasures become more ephemeral with advancing culture, while others become more intense by demotic development. The antitheses of pleasures, which are pains, pass through a like history in the individual and in the race. In all this field of activital pleasures it is discovered that they become intuitive by inherited experience, and that pleasures and pains alike are such from the point of view. We are therefore justified in affirming that pleasures and pains are qualities derived from natural properties.

This may be a stumbling-block, and hence it requires more elaborate consideration. I refer to the pain produced in the body by injury, as in cutting, tearing, concussion, compression, pinching, the stresses and strains produced by inflammation, the lesions of disease, and all the pains known as physical discomforts. Is the pain in the tooth a quality or a property? Is pain in the head a quality or a property? Is the pain from a bullet wound a quality

or a property? We have already seen that all other pleasures and pains are derivative in the individual and in the race, and appear from the point of view. Is this true of physical pain?

First, we must consider whether pain is an essential or a relational element.

Is pain, like pleasure, the product of judgment? Am I conscious of a pain, or do I infer it by an habitual judgment when the signs of pain appear in the body? Is the animal body endowed with pain as an essential, or is pain also the child of experience? In order that we may examine this subject somewhat critically, it becomes necessary to repeat briefly that which has been set forth more elaborately in a former work. There we begin with the definition of consciousness, inference, and verification. Consciousness is awareness of self, inference is awareness of the cause of the change in self, and verification is proof of the inference by experience. Now, we must especially call attention to the fact that the term consciousness is used only to signify awareness of self, and that it is not used to signify cognition. With this understanding we are prepared to proceed with the exposition. If we are conscious of physical pain, instead of cognitive, then pain itself is an essential; but if we are only cognitive of pain, it arises from inference and verification.

It is a well attested fact that a soldier receiving a musket-ball wound in battle may be so occupied with other occurring events, —so intent upon the progress of the battle,—that the wound itself may be unobserved and no pain for the time experienced. Then pain is not an essential inherent in animate matter itself, but something which arises from the point of view. It is within the experience of many men, perhaps all, that various injuries may be experienced without at once arising in consciousness, and that pain supervenes only on the cognition of the evil.

Again, physical pain grows with the experience of the individual. That which was a slight pain in childhood becomes an intense pain in adult life. In the history of races, bestial and

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human, pain becomes greater with culture. The pains of lesions and bruises grow with developing culture; the pains of parturition increase as society becomes more refined, more highly developed in culture. From these and a multitude of considerations which the contemplating mind will recall, it is made plain that physical pains, like all our pains, are derivative; that we have no consciousness of pain when that term is strictly used, but we have cognition of pain.

We have seen how cognition becomes intuitive by hereditary transmission. From the earliest tribal life to the highest state of culture the way is long and the years are counted by millions. Every animate individual in all this time has experienced the effects of lesions and bruises until the concept has been woven into the constitution of mankind by experience, and the intuition is perfected through verified judgments. It is unnecessary for the man to pass through a complex ratiocination for the purpose of discovering this variety. A trivial accident may befall a soldier in line of battle which he interprets as a wound; he hears the coming of the shell from a piece of field artillery, it strikes the ground and scatters its fragments broadcast together with chips and gravel. A bit of wood strikes the soldier; he interprets it as a fragment of shell, has the illusion of being wounded, and feels the pain and expresses all the agony which a real wound may actually produce. Animate body is not endowed with an essential of physical pain, but it develops pain by cognition of effects.

In the evolution of sports we discover a development from individual and unorganized multiple activities in many individuals to organized activities, in which special activities are assumed for special purposes, all so differentiated and integrated as to accomplish a desired end. A hundred savages, men, women, and children, will join in a dance to revolve in a circle by uniform and rhythmic steps, and every one moves like every other one. But a game of baseball is organized so that every player has a particu-

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lar function to perform which differs from the functions of all the others. This law of the organization of sports is universal.

GAMES

We now reach the fourth group of activital pleasures; these are games played in rivalry of skill and chance. Games have their root in sorcery as it is practiced by wildwood man. It seems at first that arrows or arrowheads are the pieces played—the pawns, knights, castles, kings, and queens of the game, or the cards upon which the actors are painted. In the wide geographical realm of tribal man many of these games are discovered; but they have common elements, that is, they are founded on universal concepts, and everywhere in this stage of society they are rooted in divination or the universal longing of mankind to know the causes of things and how effects may be controlled. In savagery men play for effects and control the causes, as they suppose, by necromantic figures which they carve or paint upon the pieces of the game; thus they try to win by sorcery. In later stages of culture the sorcery to a greater or less extent is abandoned, and skill is recognized as the true cause; but there yet remains an element of chance. With primal man chance and sorcery are the elements of all games, while with civilized man chance and skill are its elements.

There is a secondary though potent motive in games which inheres in the desire to take advantage for individual profit. For this reason gaming is universal among tribal men as gambling, and it is common among civilized men.

I have witnessed these games of sorcery among the aboriginal tribes of North America and have seen groups of men or women wager their ornaments and all their personal goods, even to their articles of clothing until their bodies were nude. As the game proceeds the villagers gather about and comment on the incidents of the game and recommend a variety of necromantic feats which they suppose will bring luck to their friends. Sometimes

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the play does not stop for refreshment or sleep, until one or the other of the parties have lost all; yet will the play proceed with hilarity and end with a feast and a revelry of intoxication. I have heard that civilized men gamble with the same assiduity.

Hunting and fishing are primeval industries by which wild-wood men obtain no small portion of their food. To some extent in civilized society they still remain as industries. In fact, fishing is yet a fundamental industry. But hunting and fishing are now games, and the fruit of the play is called game. Although these activities are often called sports, in science we must call them games, as for success they depend on elements of chance and skill, and the real gamester or sportsman looks with some degree of contempt on the man who hunts or fishes for food.

FINE ARTS

The fifth group of activital pleasures is that of the fine arts. We have already seen that there is a group arising from a cognition of the pleasures which are derived from metabolism; a second group, called the arts of decoration, which arise from the cognition of the pleasures of form; a third group, called the athletic arts or the arts of sport, which arise from the cognition of the pleasures of force; a fourth group, called the arts of amusement, or games, which arise from the cognition of the pleasures of causation. Here we have a fifth group, which we call psychic arts, or the fine arts, and which arise from the cognition of the pleasures of mind expressed in fine-art works.

In order that we may adequately set forth the nature of the fine arts, it becomes necessary to make a fundamental classification of them.

In a former work we set forth the vicarious nature of the senses of muscular effort—hearing and vision. These are the senses to which appeal is made. These arts have played an important role in the evolution of mankind as demotic bodies, and hence they require more elaborate treatment.

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When we desire to classify the fine arts, we find well demarcated groups from the standpoint of the properties of matter in the order in which these properties logically appear, from the simple to the most complex. We have, first, music; second, graphic art; third, drama; fourth, romance; fifth, poetry. That this is the logical order will appear when the subject is more thoroughly presented.

Music

Music is the most fundamental of the fine arts in that it more fully expresses the emotions than any of the others, while it is but a feeble method of expressing the intellections. This characteristic is well known, and music has been called the art of expressing the emotions. It further appears that few persons ever learn to read the intellectual character of music when it is made by others or even when made by themselves. I do not mean that they fail to read the staff in which music is written, but I do mean that they fail to read the argument or story of the musical composition, but rest satisfied with the emotional effects produced. Very few persons read music as an intellectual art, and there are but few critics of the art who survey these intellectual elements. Indeed, the intellectual thread of a musical composition is very slender, and much of it in the folk song of the world is unconsciously developed, like the meaning of words in folk speech. It is a growth by minute increments found to be beautiful in experience.

Rhythm—Music has its germ in the dance, for it begins with the effort to control the rhythm of the lilting folk. Rhythm, therefore, is the first structural element of music, but new elements are added from time to time in the history of man as he proceeds along the way of life from wildwood time to the higher civilization in representative time—a time long indeed.

Melody—Passing from the hunter stage to the shepherd stage we find that a new element is added to music; then melody ap-

pears fully fledged. As the more complicated dancing steps become more pleasing than the primeval monotonous step, the melodic chant becomes more pleasing than the simple rhythmic chant; that is, a rhythm of rhythms is developed which makes melody. So music was endowed first with rhythm and then with melody.

Melody is a pleasing succession of sounds, or notes as they are called in written music, having a different pitch, and we have to consider how such notes come to obtain that quality which we call melody and which is so delightful to the hearer.

The dance is a sport in which usually many persons simultaneously engage. In primitive dancing the time is marked by the voice, and the shouts of the dancers constitute a chant in which oftentimes they all take part, but at other times there is a leader and only one marks the time. As the dance develops from the simple monotonous recognition of the same step to a combination of two or more differentiated steps, they are marked by differences in the pitch of the voice. To fully understand the ultimate effect of this device, we must appreciate the universality of dancing and that it continued in the first stage of society through thousands of years.

Harmony—In a succeeding stage of society, which we call the monarchical stage, or the tyrant stage, when tribal society was developed into national society, music made another advance by the introduction of a new element of pleasure. As these new elements appear from time to time in the course of human culture, it must be remembered that they do not come into view fully fledged, but that germs planted in primordial music slowly develop until they become recognized as elements of such importance that they receive designed development in the purpose of music makers. Now, there existed in primitive music the germ of harmony which, in the progress of the centuries, came to be considered by men of such importance that special efforts were made to improve that fully recognized element itself. The

new element added to music in this stage of culture is harmony. When music was but rhythm, there was a germ of harmony in it, for the waning sound would blend with the waxing sound, and the succession of sounds that become melodious also become harmonious; but more than this: in folk chant the voices of men and women differ in pitch, and still other differences arise in the commingling of children's voices. When music became melody, the bonds which held music to the dance were broken and melody was married to song as chant was married to dance; but song music was especially adapted to the development of harmony, because it became choral music; doubtless songs were sung by individuals for their amusement and as solos for the amusement of others, but when many join in the song we have choral music. Thus the blending of tones in melody becomes at last the blending of tones in harmony. The pleasure derived from harmony does not inhere in sounds themselves; sounds are colorless to the ear. The spoken word is but sound until it is informed with a meaning; so sound as sound has no power to create emotion until it is informed with an emotional meaning, and harmony is developed as a pleasure only by long experience. Perfect evidence of this is furnished through the modern and scientific investigation of folk music. Both the melody and the harmony of different races differ in the intervals of pitch exhibited in their music. This is proof that all men may read, and it clearly teaches that the pleasures of music are derivative.

Here let us pause for a remark about the attitude of idealism and materialism toward this question. Idealism affirms that not only is pleasure as a quality created by the mind, but that even the properties of sound itself are created by the mind. Materialism affirms that the property inheres in the sounding body and the quality also in the sounding body. What we affirm is that the property inheres in the sounding body and the quality in the body pleased.

Symphony—In modern time, or the time of representative

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government, which also may be considered as the time of science par excellence, symphony has been added to music. The development of symphonic music is dependent on the development of musical instruments. Musical instruments themselves have their germ in the hunter stage of society. A tree overthrown by a tempest may be cross-cut into sections with a stone ax, reënforced by fire. Such a section may then be hollowed out with a stone adz and living coals. A vessel thus wrought serves many purposes. At night, when the tribe dances in glee, this mortar or tub for soaking skins becomes a drum. A wild gourd holding pebbles becomes a timbrel. A staff cut with notches is played upon with another and smaller one with rhythmic rasping thrum, and becomes a viol. A reed or a section of bark or the hollow bone of a bird makes a flute. A tablet two fingers wide and a span in length, suspended from a staff with sinew, becomes a roarer which is whipped through the air—the first trumpet of primitive man.

A group of such implements (and there are many others in primitive life) constitutes the first orchestra. When science comes and the nature of sound itself is understood as a property, instruments are invented and improved by the husbandry of mind until a great variety of musical instruments are developed; thus symphony grows from the soil of time. What, then, is symphony? It is a succession of melodies, every one of which is produced by a group of instruments, one of which may be that of the human voice. Now, as these instruments play in unison, one or another is selected to play the leading melody, and the other instruments are made to play subsidiary melodies in harmony with the leading melody. As the melodies pass in succession, a new theme is chosen for the leading melody, and thus there is a succession of themes.

This elementary statement seems to be necessary that we may properly understand the evolution of music and the derivative character of the pleasures which it produces; for symphonic

music is pleasing because harmonic music is pleasing, but in a higher degree; harmonic music is pleasing because melodic music is pleasing, but in a higher degree; melodic music is pleasing because rhythmic music is pleasing, but in a higher degree.

In music, as in architecture, the pleasure is developed by differentiating and integrating the elements, that is, by higher and higher organization.

Graphic Art

We must now consider the nature of graphic art and its evolution through the four stages of culture which we have denominated the hunter stage, the shepherd stage, the tyrant stage, and the freedom stage.

Sculpture—Hunter man carves images of various objects in wood, shell, bone, and stone; he also molds such forms in clay. This is the first form of graphic art as discovered in ethnology, which is the science of tribal culture. Now, there is a special motive in this stage of society urging men to excellence in primitive sculpture. Much of the time of wildwood men, or men of the hunter stage, is devoted to the pursuit of religious activities. Dancing is always a religious activity with primitive men, and it is the primeval system of worship. But to this element another is added, that of representing to the gods the desires of men; for this purpose an elaborate system of representation is developed. The gods worshiped are the animals, but all things known to wildwood men are animals. The celestial bodies are animals traveling in a path along the firmament, from east to west, where they turn again to find their way underground to the east. All rocks are animals fixed to the earth by magic or scattered loosely upon the earth because, being asleep, their ghosts have departed, for that is the theory of sylvan life. Trees and smaller plants are animals fixed to the earth by necromancy. Clouds are animals, streams are animals, seas are animals, and the clouds are ever descending upon the earth and migrating by streams to the sea, for every drop of water is an animal.

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This theory of animate life is universal in tribal society. In this stage, when men carve in earnest, they are engaged in producing the instruments of worship. These objects are not themselves worshiped in the true sense, they are only the emblems of worship which are displayed before the gods that they may comprehend the wishes of the worshipers. The emblems displayed upon the altar are of two kinds: first, they are the emblems of the gods worshiped; and, second, they are emblems of the good things which the worshipers desire. Thus a savage altar is adorned with the images of the gods and the emblems of the blessings for which the savage man makes request. The altar is the table on which these emblems are displayed. The things desired may be represented by images, as when game is asked or when fruits are besought. But there may be many accessory objects placed upon the holy table, as when in prayer for corn that it may ripen and become hard the thought is conveyed by fragments of crystal that lie beside it on the table. The crystal is an adjective that qualifies the corn. Savage men always believe that they have lost the language of the gods, and thus they eke out the meaning of their words by the illustrations which they assemble upon the altar. That prayer may be understood is the primitive motive for excellence in carving.

Relief—The next step in the evolution of graphic art is taken in the shepherd stage. Wildwood men etched crude pictures on rocks, or scratched them on bones, horns, bark of trees, and on the tanned skins of animals. Such etchings are mere flats; they always fail to express relief. In barbarism they are made to show a truer form, and man learns to express in painting the meaning of tints and hues as they are reflected from bodies. The motive which urges to excellence is the desire for clearer expression in altar symbolism.

Perspective—In the succeeding stage a third step is taken. Here the emblems of the altar are painted also upon temple walls; but the themes of mythology are mainly the themes of

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painting, and with this same motive the master works of art are produced. All along the course of the history of painting, religious zeal is the potent motive for excellence.

This advance consists in the acquisition of perspective, when objects are placed in the painting in such manner as to show their relative position, and the three dimensions of space are recognized in the production of the work. Now conventional signs are no longer needed. In the stage anterior to this, perspective is conventional, as if a man should say, "I have painted two horses on the canvas, but this one must be considered as far away because it is put on the right side of the picture; things on the left must be considered as near by." A great many devices for conventional perspective were invented by tribal men before they acquired the concept of true perspective.

We must here call attention to an important law of demotic evolution. Growth is made usually by minute increments. Rarely indeed is there a sudden outgrowth, but the increments of development are all made by men with a genius for the activity. Such a man is a leader in the arts. A multitude is led by one, so that demotic evolution is dependent very largely for its initiative on the few which the many learn by imitation. This law is observed not only in all the esthetic arts, but it rules throughout the whole realm of human activities. But initiative through the individual becomes demotic, because the many steps in advance which leaders make as minute increments of progress are consolidated through their adoption by the many. A leader must have a following or his leadership is in vain.

Chiaroscuro—In the fourth stage of culture still another element is added to painting. This is chiaroscuro, or the delicate recognition in painting of the effects of light and shade in the several hues of the work. This is the highest characteristic of art as conceived by the modern painter. The artist may succeed in all else, but if he fails in this it is failure indeed. It is the difference between the artist and the artisan.

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The intellectual characteristics of works of graphic art are more pronounced than those of musical art, while the emotional characteristics are less vividly expressed. A painting may be excellent, though the theme may be trivial; but a great painting must have a great theme, and the picture must be judged by its successful presentation of the theme. We cannot here stop to treat of the evolution of themes, but will reserve the subject for a future occasion. Here we will be content with the simple expression of the judgment that no great and enduring work of art can be wrought which has not also a great theme.

We must not fail to call attention to a branch of graphic art which has taken root for itself and thus become independent. I refer to the development of picture-writings for the purpose of communicating the thoughts of men to other men. The origin of alphabets in picture-writing is now an accepted conclusion of science. When graphic art was not under the dominion of the religious motive, but was impelled by utilitarian designs, it worked out a very different result, becoming more and more conventional while painting itself comes to be more and more realistic.

Drama

Drama constitutes the third group of fine-art activities in logical order.

Dance—Again we have to seek for primal motives in religion. Already we have affirmed that dancing is the primeval activity of pleasure. It is the first activity which has joy for its motive. The dance is deeply imbedded in the constitution of animal life. The various scientific works and essays on play which have been produced in scientific time clearly set forth this doctrine, though some phases of it are yet in controversy.

That the dance is a religious activity is revealed by a study of the lower races of mankind. Dance is a play; not imitative, but religious play. Here the play motive and the religious motive are differentiated, so that we can separate sport from drama

but religion and drama are one in their tribal life. Dancing is the first primeval expression of joy as praise, and is the fundamental element of worship.

Sacrifice—In the second stage there is found an element of religion, and hence of drama, which has its beginning in the first stage, but is fully developed only in the second. In the first stage, in order that men may express their wants, they display them either by placing the things themselves or their symbols upon the altar. In the second stage the objects desired are sacrificed. When a deity is worshiped, the things desired are poured out upon the ground as oblations, or consumed in the fire as offerings, that the ghosts of the things desired may be possessed by the ghostly deity.

When human beings are buried, whether in the earth, the air, or the fire, the same worship is accorded them and the sacrifice made at the grave. So the second stage of drama or worship is sacrificial, while there yet remains the element of praise in the dance. We are most familiar with the characteristics of this stage of the drama in the writings of Homer; however, there is a vast body of literature on the subject from other sources. The science of ethnology reveals its nature and characteristics in a manner which is clear and forcible. All the tribes which are investigated by ethnologists present examples for consideration.

Ceremony—The third stage of the drama, which is fully developed in the imperial stage, also has roots, more or less obscure, in the earlier stages; for shamans, in instructing the people in mythology, devise curious and interesting methods to enforce their teaching by representing the scenes in a more or less dramatic manner, in which the neophytes of the shamanistic order take part, and, to some extent, other members of the tribe are assistants.

This difference in the nature of the drama of tribal society and of national society must be understood. The drama is not designed as a language by which men may talk with the gods, but

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it is designed as a language by which men may be instructed. In savagery, the language by which the gods are addressed is sign language; in barbarism, it is gesture speech; in monarchy, the national god is the only true god,—all others are devils,—and this true god understands and employs the national language, and religious drama is a gesture speech designed to instruct men in divine lore. This new element appears in one form in the more highly developed savage society, in another form in barbaric society, but in tyrannic society it is fully fledged as ceremony. It is shown in the account which we have of the Eleusinian mysteries; it appears also in the dramatic performance of many nations of Europe, Asia, and Africa, where the drama becomes an institution promoted and regulated by the ruler, and drama is the principal system of worship in the national religion, while local worship is restricted largely to tribal methods. This new element of worship is developed by transmuting the actual sacrifice into ceremonial sacrifice. No longer are hecatombs slain; no longer are wines poured upon the ground; no longer are cereals burned in the fire; but a ceremony representing these things is instituted and held to be sacred, and especially efficacious, while praise is not only terpsichorean as in savagery, not only athletic as in barbarism, but it is pageantry. Thus, in the tyrannic stage, we have ceremony.

Toward the close of this stage religion and drama are partially divorced, so that there is a drama more or less distinct from religion.

Histrionic Art—We have now to consider drama as an esthetic art in the fourth stage of culture. This stage is brought about as a revolution in society fundamentally through the agencies of science; not that there is no science anterior to this stage of culture, but that its power has not attained that potency necessary to the transmutation. Science is only simple knowledge, which is but a verified inference, and in all ages men have known something. A few simple facts known in savagery become germs

that develop and multiply through the centuries until science becomes a controlling element in civilization.

The time of science is marked by events, but the time of science as a stage of culture may be considered as beginning with the discovery of the new world and the invention of printing, together with scientific principles that had been developed up to that time. Research is born of the love of truth, and the truth discovered breeds more research, so the child becomes the parent that new children may be born; and when these generations have multiplied until they become a host, the multitude of scientific motives extant in the world constitute a power over society ever more and more efficacious in the regeneration of mankind.

Heretofore we have sought a motive for drama in religion; now we must seek it in the desire to truthfully express life—the life of man in society. The promoter of drama as entrepreneur or undertaker of dramatic enterprise, may have a motive of gain. The artist may have a motive of ambition, but it is soon found that these motives may be gratified to the highest degree only by a most deft expression of the truth; so the motive for evolution is now the desire to express the truth in the action which is designed to represent a trait of character, and the artist, be he dramatic writer or actor, strives to express the emotions of the scene in the most vivid and truthful manner. Columbus discovered America that Jefferson might portray *Rip Van Winkle*.

> He who hath ears to hear, then let him hear
> And sage become that he may come a seer.

Romance

Romance is the fine art next in logical order. The first form of romance is myth. We cannot understand its nature without understanding the cosmology with which it is associated. All tribes, savage and barbaric alike, have a cosmology based on a notion of seven worlds. This notion is developed through that phase of the evolution of language which Max Müller has called

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a disease. Müller's characterization, though more poetic than scientific, is yet a legitimate trope. In the evolution of language old words are used with new meanings, and often the old meanings fade while the new meanings become standard, which seems to be at variance with the etymological signification of the terms. Primitive languages absorb the entire assertion in one word; their words are holophrastic; a single word performs the offices of all the parts of speech, for parts of speech are yet undifferentiated; therefore, a word is a complete sentence. When words are sentence words, the phenomena which men attempt to describe with them are expressed in such terms that linguistic development leads to a cosmology of space.

In this manner primitive man is led to speak of seven elements of space. There are the here, the center, the midworld; the zenith, the above, the heaven world; the down, the lower world, the nadir, the hell. The apparent rising of the sun in the east and its apparent course to the west seem to divide the plane of the earth into two parts. In speaking about the east, the eastern direction, the eastern land gradually becomes an eastern world; and in speaking about the west, the western direction, the western land, it gradually becomes the western world. Then, as men must still talk about the north and the south as distinct from the east and the west, they also become worlds. Thus we have the cardinal worlds; these with the midworld, the zenith world, and the nadir world constitute the seven worlds of the cosmology of savagery.

The seven worlds are universal; every savage and every barbaric tribe recognizes and believes in them, as they are inexorably developed as notions in the mind through the power of the language used to express thought about relations of space, especially as it refers to commonplace geography. Every day the savage man has to tell of his wandering or the wanderings of others over the surface of the earth, or to give directions to others how to find places and objects, so that in this use of holophrastic terms

he unconsciously reifies the relations of space and makes them seven distinct worlds. In tribal life the notions of seven worlds are intuitive as a habit of judgment.

If a man habitually speaks of an object in terms which involve erroneous notions, the habit of forming the judgments involved becomes intuitive. Persuade him that eating parsnips on Wednesday is a taboo and may lead to bad consequences; a constant avoidance of this habit will lead him to habitual judgments of evil, and he will believe that such judgments are intuitive. It is thus that qualities are generated in the mind from the point of view of the individual.

Beast Fable—Wildwood man worships the beasts as gods. As we have already seen, he believes that all bodies have animate life; that is, he interprets the phenomena of the world from the standpoint of the belief that all bodies, like human bodies, are endowed with mind and that they have motives and enjoy pleasures and feel pains and exercise will as men do. The savage man interprets the environment of bodies as if they were human bodies. This is what has been called anthropomorphism.

With this view of the world savage man develops a vast body of story lore which reveals his thoughts of the nature of things with the causes and effects of events that constitute the history of life and change. This lore is myth. But more; by agencies which are now well recognized in science, he believes that every body has a dual existence, as gross body and attenuated body, and that the attenuated body may enter the gross body or depart from the gross body at will, and that the attenuated body may sojourn in one gross body or another at will.

The attenuated body is known in our language as ghost, but every primitive language has a name of its own, as *manitu* in the Algonquian languages, and *pokunt* in the Shoshonean languages, and *wakanda* in the Siouan languages. This ghost is held to be the cause of things. All events are caused by ghosts. Every distinct linguistic stock of the world has a body of myth consist-

ing of stories related about the doings of human beings and mythic personages, which always assume that the ghosts of the other personages influence the ghosts of men, or that the ghosts of men influence the ghosts of other personages. This is the essence of barbaric myth or romance, for myth and romance are one in this stage of culture.

Power Myth—In the second stage of myth or romance we discover a radical development in the personages of the story. A new class of deities is found. From the same linguistic cause which we have set forth, the conspicuous phenomena of nature are personified as gods. The powers of the universe as they are known in that stage of society become the heroes of myth. The animal gods remain, and with them the human beings; but all the gods of savagery are assigned minor parts, and the new gods constitute a superior order of beings.

This stage is popularly known through the writings of Max Müller and others who have devoted much time to the study of Sanskrit literature. It is set forth in the popular accounts of Norse mythology and also in Germanic mythology. Again we find it well recorded in Homer and Hesiod. In fact, there is now a large body of literature gathered from various lands which is being carefully studied for the purpose of discovering the characteristics of this stage of myth.

While romance is beast fable in savagery, romance is power myth in barbarism. To understand this transmutation we must see the change which is wrought in the concepts of worlds or in cosmology. It is a change which begins in savagery, but is more highly developed in barbarism. The concepts of space worlds control the concepts of the savage mind to such an extent that all of the attributes of bodies are referred to the worlds as properly belonging to them. Thus colors originally come to be classified as seven, for the act of expressing concepts in words is more potent than the sense of vision in controlling the judgment of the color of objects.

The prismatic colors, as such, are unrecognized; but hues, tints, shades, and even patterns are classified, and there is a tendency to classify them as hues. The scheme of colors, perhaps, differs from tribe to tribe; of this I am not sure, but this I do find among some tribes: blue is the color of the zenith, and things are said to have sky color. It is a very natural mistake for man to reach the conclusion that sky color is made by the sky or that it comes from the sky by the habit of language which already has been set forth. Color is thus reified and assigned to a world. Darkness, or black, seems to primitive man to come from below, and as darkness is reified, it is believed to come from the nadir world. Green is held to belong properly to the midworld, for it is the color of plant bodies and is seen nowhere else.

In tribal society the colors seem to be variously assigned to the cardinal worlds as hues, tints, shades, and patterns. In the cases which I have especially investigated, red belongs to the west, white to the east, yellow to the south, and gray to the north.

When the chains which hold drama to religion are dirempt and they can go forth to lead a free life, both start on new careers. Drama becomes histrionic art indeed, and the stage becomes the mirror in which are reflected the causes and consequences of the deeds of life. Religion soars on wings of aspiration into the empyrean of hope—hope for a purer and better life which bears fruit in purer and better conduct.

The germ of dramatic art is the dance, which in its first stage is religion. Of course religion must be distinguished from theology. Theology is a system of opinions, while religion is a system of worship. Religious motives become the seed of graphic motives and also the seed of musical motives. We see that both musical art and graphic art are founded on religion. We shall proceed to show that the other esthetic arts are based on religion.

The intellectual and emotional elements of drama are pretty evenly balanced in the last histrionic stage; but if we consider

its growth from the beginning I think we shall find a steady development from emotional to intellectual art.

We have yet to note that the pleasures obtained from dramatic activities are derived. There is no essential in nature as a distinct property on which pleasure is founded, but it is founded on the relative element of consciousness which is inference and which produces judgments. All our knowledge of the pleasures of dramatic entertainment are founded on judgments and are good or evil from the point of view which we have attained in the progress of culture. It needs but a single illustration to make this fact evident: The drama of the savage, dancing about the firelight which glints the trees of the surrounding forest, does not constitute an entertainment for which the civilized man longs and which he would sedulously promote. That which brings gladness in one stage, brings contempt in another. True, the ethnologist may be delighted to witness the wildwood scene and even to engage in its revelry; but his purpose would be not to dance for joy, but to dance for knowledge.

In a similar manner which we cannot stop to explain fully, all the attributes of bodies as properties or qualities are assigned to regions by wildwood men and shepherd men. The increasing knowledge of the world leads to a geographical knowledge of immense distances on the horizontal plane of the earth as it is then supposed to be; but the cardinal attributes still remain to be grouped about the one which seems to be the most conspicuous.

A survival of this classification of attributes in world schemes still remains in modern time when attributes of good are assigned to a world of space, as the heaven above, and attributes of evil are assigned to the world below—hell.

The attributes which were assigned to the cardinal worlds are grouped about the most conspicuous attribute, as the cardinal worlds are abandoned owing to an increasing knowledge of geography. Finally, they settle down into four elements; the cardinal worlds thus become elements—earth, air, fire, and water—and the

bodies of the worlds are believed to be composed of these elements in varying proportions.

In Greek and Roman classics we find much about these four elements; but the development of four elements out of four worlds belongs largely to barbarism, though perhaps it is not fully completed until the stage of monarchy is reached.

Necromancy—In the monarchical stage of society the four elements—earth, air, fire, and water—play a very important role. It is now the theory that bodies are composed of these elements, and it is a theory that the difference between bodies depends on the different proportions of these elements which they severally present. The cardinal worlds thus become cardinal elements, and a birthmark remains when they are put in antithetic pairs. Earth is opposed to air, and fire is opposed to water. This stage of society is the stage of alchemy in the philosophy of bodies. The wondrous transmutations that appear in nature are explained as alchemical changes in combining or freeing the elements. The stories now invented are stories of necromancy in which theories of ghosts and theories of alchemy are compounded. This is also the age of chivalry, and the stories told are tales of wars and wiles, and the heroes are kings, warriors, wizards, dwarfs, giants, and demons. They often wander about the world for the purpose of adventure or because they are engaged in wonderful enterprises. Thaumaturgy—not natural wonders, but invented wonders—now constitutes the principal theme of romance. Myth is transmuted into romance.

The three worlds remain as earth, hell, and heaven. We cannot stop to catalogue these medieval romances, but they constitute an extensive literature in themselves and there is an extensive body of literature about them. Often in the next stage they become the themes of poetry. The Victorian bard has used some of these medieval themes in the *Idylls of the King*.

Novels—It must constantly be borne in mind that romance in

its various stages may have themes to a greater or less extent the same throughout, but that they differ in the method of treatment. Beast fables may yet be told, but merely as fables to teach a lesson. The nature myths may yet be used as illustrations and embellishments, and romances may yet be written with all the thaumaturgy of the middle ages to give literary amusement to people who are not supposed to believe in necromancy.

With this warning we may go on to describe the romance of the last stage. To the world's store of romance new tales are added—fictitious histories in a series of events where causes conspire to produce effects that have an intellectual and emotional interest. In an especial manner modern tales are designed to teach a lesson of good and evil, and there are many romances that are doctrinaire in motive.

This is the transmutation brought by science upon the characteristics of romance. Tales are no longer told to be believed, but are told to teach lessons. Romance is fundamentally designed to give pleasure, but at the same time is made to teach wisdom in conduct. If the potion is but a coated pill, the medicine is refused; but if a dram of moral truth is deftly mixed with a pound of delightful representation of men and things, the moral becomes a luxury.

Poetry

The fifth in order of the fine arts is poetry. All of the esthetic arts are activities designed to produce pleasure. This is their fundamental purpose. Poetry is an art of pleasure. Its fundamental purpose must be pleasure, although it sometimes may be a good method of presenting the truth; in fact it often serves this purpose in an admirable manner, but its philosophy must be veiled whether it be intellectual or moral wisdom.

That which makes poetry is the method of expression that is adopted by poetry. In music the method of expression is rhythmic sound and the combinations of rhythmic sound which

appear also in melody, harmony, and symphony. Graphic art is expression of form which at first gives us form as molded in sculpture, then form as relief, then the combination of form in perspective, and finally the delicate expression of forms in values or chiaroscuro. In drama we have an art which employs gesture speech as its mode of expression. Its root is the dance, and the first stage of the drama is terpsichorean; its second stage is sacrificial, its third stage is ceremonial, its fourth stage is histrionic. Romance is expression by fictitious history. It appears first as beast fable, then as power myth, then as necromantic tale, and finally in the novel.

In poetry the method of expression is metaphor. We are yet to see the stages through which metaphor is developed. Again I must remind my reader that all of these stages have roots in the primitive stage, that they develop by minute increments, and that a characteristic of poetry is never developed in full panoply of action.

Personification—Personification is the germ of poetic expression. Personification is the fundamental error in the philosophy of savagery. Tylor called this belief animism; already we have set forth its nature. It arises from the mental necessity of making judgments and comparing them with the inferences which the mind draws from sense impressions. The savage interprets the world of bodies in the environment from the concepts of human bodies. From the standpoint of psychology this is anthropomorphism, while from the standpoint of philosophy it is animism. This animism or anthropomorphism is personification from the standpoint of poetry.

Wildwood man is of the opinion that all bodies are animate and that all the tribes of the lower animals, and all the tribes of stars, and all the tribes of clouds and streams, and all the tribes of plants, and all the tribes of stones are tribes composed of clans like his own. The philosophy of savagery is the essence of poetry, but before it is recognized as such it must undergo won-

drous development. This philosophy must first become a religion before it is etherealized as trope, which is the essence of modern poetry.

In the earliest poetry holophrastic words are used as nouns or substantives with adjectives of quality in exclamatory sentences (remember the distinction between qualities and properties) to mark the time of a complement of steps in the dance of worship. In every clan or tribe in this stage of society there is a leader who is the master of the dance and who regulates it with rhythmic chant in which others may take part, when the solo of the shaman becomes the chorus of the people. The exuberance of dance and the inspiration of shout unite to produce emotion—wildly hilarious if it is a dance of praise, wildly vengeful if it is a dance of war, wildly wailing if it is a dance of mourning for the dead. Thus is produced an ecstasy of joy or hate or sorrow.

In the exclamatory phrases of song are named the personified objects that are supposed to be inspired with motives like those of men, and hence the adjective element of the song expresses the good or evil which is the theme of poetry. The earliest poetry in this manner involves a double expression, one of personification and another of qualification.

Similitude—In the second stage powers are personified as if they were bodies, and there is developed a new class of deities which are supposed to be superior to the old gods, and the old gods are called demons; not yet devils, mind you, but only demons. Now, there are many kinds of these demons, as elves, fairies, muses, sirens, and what not, while human beings are sometimes giants and pigmies. This is pertinent to the present exposition. Personification in this stage is the creation of invisible bodies out of pure forces that are supposed to exis. independent of bodies: that is, properties can exist in some invisible state like that of ghosts. Man personifies not only bodies, but he also personifies qualities.

In this stage qualification is developed into similitude. That

which is affirmed by the adjective element as great or small, as strong or weak, as beautiful or ugly, or any attribute expressed by a qualifying adjective, is reënforced by a poetic similitude. The attribute or the person acting in a specified capacity is always like something else, and the poetry in this stage is filled with elaborately developed similitudes. The best illustrations of this characteristic of poetry are found in Homer, but they may be found in all the poetry of the upper stage of tribal society. Opening at random a copy of Bryant's *Odyssey*, on the first page I chance to see I find this passage:

> . . . for sure
> I never looked on one of mortal race,
> Woman or man, like thee, and as I gaze
> I wonder. Like to thee I saw of late,
> In Delos, a young palm-tree growing up
> Beside Apollo's altar ; for I sailed
> To Delos, with much people following me,
> On a disastrous voyage. Long I gazed
> Upon it wonder-struck, as I am now,—
> For never from the earth so fair a tree
> Had sprung. So marvel I, and am amazed
> At thee, O lady, and in awe forbear
> To clasp thy knees.

In this stage of poetry qualification is used as a poetic element as in the first; then qualities are personified as well as bodies, and qualification is reënforced by similitude.

Allegory—In the third stage of society certain world attributes are explained as world elements: these are earth, air, fire, and water, and the proportion of these elements in bodies of the earth gives rise to their attributes. In philosophy this is alchemy; but it is only the alchemy of bodies, while the ghosts are psychic beings and only psychic attributes are personified.

A gulf now exists between ghost and body. The ghost is spirit or essence, something which can be distilled and which may pervade space like an aroma, or itself be wholly spaceless and hence formless. It may occupy any point of time present,

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past, or future, for it is timeless; hence it is the ghost of memory and prophecy. But the body is now gross matter—dead and subject to the manipulations of alchemy. With the development of personification and differentiation in theory between ghost and body there comes a development of similitude into something else; this we must now set forth.

The similitude is now elaborated into the foundation of an allegory upon which is erected an edifice of doctrine, or, if you will allow another illustration, the similitude becomes a warp into which a woof is woven with patterns which constitute a tapestry of doctrine.

I know of no better way of setting forth the nature of allegory than by directing the attention of the reader to Spenser's *Faerie Queene*, in which he will find an allegory of allegories—a grand allegory made up of many adjuvant allegories. Six books of one allegory are composed, every one, of twelve allegories. The principal characters of the grand allegory are personified qualities. In the first book holiness is personified as "St. John the Red Crosse Knight"; in the second book temperance is personified as Sir Guyon; in the third book chastity is personified as Britomartis; in the fourth book friendship is personified in Cambel and Triamond; in the fifth book justice is personified in Artegall; in the sixth book courtesy is personified in Calidore; and throughout the poems many other qualities of good and evil are personified. These personifications are the heroes of a succession of necromantic tales relieved by many wild adventures.

The literature of romance and poetry alike which belongs to this stage of culture is very abundant, and I need but mention another instance or two to make it clear to the reader. Bunyan's *Pilgrim's Progress*, Dante's *Divine Comedy*, and Milton's *Paradise Lost* are excellent examples.

Trope—In the fourth stage of culture chemistry has supplanted alchemy, medicine has supplanted sorcery, astronomy has supplanted astrology, and science has supplanted cosmology.

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All kinds of personifications appear, but in a new light with a distinct cognition that personification is poetic. All kinds of personification thus become tropes, and mind itself is clearly understood to belong only to animate beings. Qualification, similitude, and allegory still remain with a more or less clear cognition that qualities are but qualities, similitudes are but similitudes, and allegories are but allegories, and that they are legitimate only as metaphors and constitute only a poetical method of expression through which the wisdom of science may be expressed in such manner as to impress them deeply upon the heart. Trope, therefore, is the last and greatest acquisition to poetical art. Romance is poetry without rhythm. Poetry is romance with rhythm, but there is added to it a much higher element of metaphor—the special method of poetic expression.

There has grown up in the history of poetry a recognition of four classes of poetry, namely, the lyric, the epic, the dramatic, and the idyllic. These names pretty well express the characteristics of the four kinds of poetry herein enumerated. If poetry is to be classified under these terms, they require both some restriction and enlargement in their limits. Lyric poetry is pretty well defined when we call it song poetry. Epic poetry is pretty well defined when we call it similitude poetry; but many poems which have sometimes been called epics are excluded. Dramatic poetry is not well defined as allegoric poetry if it is held to mean that poetry which is constructed as dialogue; but it is well defined if we understand it as that poetry whose principal element is dramatic, for then it will be seen that every dramatic poem is an allegory of good and evil. Idyllic poetry is well characterized as poetry whose chief element of expression inheres in trope. Read again the *Idylls of the King* for the purpose of seeing how their dramatic characteristics are subordinated to tropical expression, and I think you will conceive that Tennyson was right in characterizing them as the *Idylls of the King* rather than as the *Allegories of the King*.

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There is a fact in history that here must be considered in order that we may not obtain an erroneous opinion about the argument set forth in this essay. The Roman and Hellenic peoples expanded prematurely into a degree of culture more than two thousand years ago, in classical times. The political institutions which they developed at that time, because they contained an element of hereditary rank and especially an element of slavery, did not furnish an enduring foundation to the highest culture of the age. History now proves that many of the elements of culture to which classical times had attained as a blossom of fine arts, were not sufficiently rooted in a soil of free institutions. That classical culture might firmly be founded, a greater liberty had yet to be given to men, and that there might be greater liberty there yet had to be greater scientific knowledge. So the superstitions of the dark ages constituted but a cloud under which mankind labored while it laid the foundations of representative government.

We need not review the history of poetry to show how its elements have been developed; manifestly all that is good or bad is derivative; all of the esthetic arts are found to be derivative.

Pleasures and pains arise from judgments, and do not arise from consciousness but from inference. All of the phenomena of pleasure and pain arise in the mind through the point of view; they are therefore qualities and not properties. All matter is not endowed with mind, but all matter is endowed with consciousness. The relative element is choice, which becomes inference in the formation of judgments. There can be no mind until there are organs of mind. Until this condition arises in the development of animate life there is no mind, but when it does arise this mind makes judgments. As the judgments are inferences only, until they are verified, there is no cognition until there is verification, and the cognition of pleasure or pain is reached only by inference and verification. This is what we have intended to express by saying that pleasure and pain are derivative.

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THE CALCHAQUI: AN ARCHEOLOGICAL PROBLEM[1]

By DANIEL G. BRINTON

The titles given below name but a small fraction of the articles and works which have appeared in the last decade on the ancient tribes of the Calchaqui and the archeology of the area they inhabited.

This fervor of investigation is fully justified by the importance of the questions to be settled. They rank among the first in the palethnology of the South American continent. Nowhere else east of the Andes are found remains of a culture rivaling that of Peru, and rising distinctly into that of the Age of Metals.

What relations did this culture bear to that of the Aymara and Quichua? Was it the child or the parent of the latter? Or does it reveal an independent center of civilization? What were the ethnic and linguistic affiliations of the people who occupied that area at the time of the conquest, and were they the authors of that culture?

These are the inquiries which for years have been engaging the attention of the leading antiquaries in Argentina, and it is my intention at present very briefly to state the conclusions to which they have arrived.

A few descriptive words will not be amiss. The ancient province of Tucumán, of the once viceroyalty of Buenos Aires, lay at

[1] *Calchaquí.* Por Adán Quiroga. Pp. 492, and app., pp. xxvi. Illustrated. Tucuman, 1897. Vol. I.

Notas de Arqueología Calchaquí. Con dibujos. Por J. B. Ambrosetti. *Bol. del Instituto Geográfico Argentino*, 1896,-1897.

Die Calchaquis. Von Dr. H. von Ihering. *Das Ausland*, Jahr. LXIV, Nos. 48, 49.

Las Ruinas de Watungasta. Las Ruinas de la Fortaleza de Pucará. Por Gunardo Lange. *Anales del Museo de la Plata*, Seccion de Arqueología, 1892, etc.

Tesoro de Catamarqueñismos. Por S. A. Lafone Quevedo. *Anales de la Sociedad Científica Argentina*, Tom. XXXIX.

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the foot of the Andes, amid the upper feeders of the Rio Dulce and Rio Salado, between south latitude 26° and 29° and west longitude 63° to 66°, and thereabout. The most interesting portion of this region, archeologically, is that known as Catamarca, which includes the valleys of Yocavil, Famaifil, Andalgalá, and others. Here are situated the remarkable fortress of Watungasta with its stone walls and cylindrical brick towers; the extraordinary fortified camp of El Pucará, 23 kilometers long and 9 wide, with stone walls 3 meters in height, flanked by circular redoubts with interior banquettes; the majestic remains of the Cerro Pintado; of the Punta de Balasto; and many others. For scores of leagues the soil yields abundant testimony of a dense and advanced ancient population. Foundations of stone and brick walls, fragments of neatly turned painted pottery, cemeteries where the dead were interred in large jars; stone axes, and other stone and bone implements; bells and ornaments of copper, needles of silver, chisels and plaques of bronze, numberless images, idols and amulets of stone, terra cotta, hardwood, and metal, rows of monolithic menhirs recalling those of Brittany, strange figures carved or painted on the flat surface of rocks, —these abounding vestiges of a vanished people still mutely testify to a progress in the arts and a development of social condition scarcely if at all surpassed anywhere on the continent of America by its indigenous inhabitants.

What do we know of these people by history or tradition? That fountain of legendary lore, Garcilasso de la Vega, tells us that they voluntarily submitted themselves to the rule of the Incas,[1] and von Ihering places the date of the occurrence about 1300 A. D. Tucumán thus became part of the Incasic province of Colla Suyu. Certain it is that the Spaniards, exploring the country in 1536 and later, found the Quichua tongue understood everywhere by the chieftains, although not by the common herd.

At that date the vales of Catamarca were inhabited by those

[1] *Comentarios Reales*, lib. v., cap. xxv.

whom the chroniclers call Calchaqui, which is apparently the Quichua *'kallchay-cuy*, "irascible, ill-natured," a signification very suitable to these natives, for their wars and revolutions continued with little intermission until they were finally exterminated in 1664.

A double question here arises: What was the affiliation of these Calchaqui? And were they the builders of the great structures of Catamarca and the begetters of its civilization?

It must be said that no satisfactory answer has yet been given to the first of these inquiries. We have, in fact, no positive relics of the language of the Calchaqui; not a word. I say this with full knowledge of the analyses of local names by Lafone Quevedo, Quiroga, and others. The latter concludes that they spoke the tongue called by the missionaries "Cacana," and that this was related either to the Araucanian or to the Guaycuru dialects of the Chaco. The industrious student Florentino Ameghino[1] argues from certain evidence that their tongue was a dialect of the Aymara; von Tschudi maintained that it was related to the modern Atacameño of the Pacific coast; while Dr. Th. Waitz set it down as a corrupt dialect of the Quichua. Such wide divergence among competent scholars proves only that the material is wanting to decide the question.

After all, it is of less interest than it would be, if we were to consider the Calchaqui as the exponents of the ancient culture. But of this there are grave doubts. The earliest explorers nowhere report them as a civilized people, and describe the land as filled with ruins when first visited. Therefore, von Ihering, Quiroga, and other archeologists incline to believe that the civilized builders of these remains had been overcome and dispossessed by wild and savage tribes long before the whites reached the region, very much as the mound builders of the Ohio valley had also succumbed to the inroads of barbarians, and fled or were exterminated.

All the archeologists agree in one point, and it has been es-

[1] *Antigüedad del Hombre en La Plata*; tom. II., cap. xiii.

pecially emphasized by Ambrosetti—the Catamarcan remains are throughout Incasic, in design, technique, and symbolism. Of this identity of inspiration there can be no question, and it has been shown in a hundred details. We must, therefore, decide whether this was an extension of Incasic culture beyond the jurisdiction of Incasic rule; was it that of a portion of the Incasic state; or, as von Ihering boldly suggests, do we find in the vales of Catamarca the very source and birthplace of the Incasic culture itself?

These questions are still open. The vast collections in the Museo de la Plata, the researches in craniography by ten Kate, in linguistics by Quevedo, and in symbolism by Ambrosetti, are not yet sufficient to sustain either opinion. Much has been hoped from a comparison of the petroglyphs, and both Moreno and von Ihering have ventured boldly in the identification and interpretation of these rude markings. But nothing convincing has resulted from the similarities they point out; such recur between these inchoate designs everywhere.

That the religious ideas expressed in the symbolism of the remains of sacred art in the Catamarcan valleys are strikingly similar to those of the Incasic faith is a strong point which has been well brought out by Ambrosetti. The serpent symbol is expressed in identical technical form; the costumes of gods are often alike; the *huacanqui*, or love charms, are the same; the Peruvian trinity, *tangatanga*, recurs in Catamarcan wood-carving, and the curious old man with the long beard (un-Indian as he seems) appears on vases from the Calchaqui region as well as in the legendary figure of Viracocha.

All this forcibly impels to the conviction that the Catamarcan culture was essentially Incasic, but that it had already passed to degeneration and destruction before the arrival of the whites, and that the nations these found in the picturesque valleys of Tucumán were not the builders but the destroyers of the ancient glory of the region.

ABORIGINAL AMERICAN ZOÖTECHNY

By OTIS TUFTON MASON

INTRODUCTION

PLACE OF ZOÖTECHNY IN A GENERAL SCHEME OF ACTIVITIES

The activities of man are divided into classes according to the department of nature in which they take place; to wit, exploitation of the forces of nature; the invention of mechanical devices for the domestication and use of these forces; the activities associated with the mineral kingdom, with the vegetal kingdom, with the animal kingdom, and with the human species. All industries associated with the animal kingdom are included in the general term zoötechny.

AMERICA'S PLACE IN ZOÖTECHNY

In all times and places the human species has been intimately associated with animal life to obtain food, clothing, shelter, and material for its arts. The American continent, before its discovery by the whites, was inhabited by a subdivision of mankind that occupied the lower and middle stages of human culture. In a general way, therefore, the study of zoötechny in this area will make plain the same kinds of activities as those which existed in other parts of the world from the beginning of human life on the globe. Aboriginal American zoötechny embraces every phase of Indian life growing out of the connection between man and the beasts of the western hemisphere in precolumbian times.

A thorough prosecution of this study is very much embarrassed by intrusions from the eastern hemisphere in historic times. Omitting all inquiries with reference to the origin of arts on this continent, there is no doubt that in every part of America, from

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the very earliest intrusion, the activities of the aborigines were changed and accultured from abroad. These influences on the Atlantic side were by Scandinavians; by English and French in Canada and the United States; and by the French, Spanish, and Portuguese in Middle and South America. On the western side the Russians, in the northern parts, brought not only the arts of Siberia and of the uncultured elements in Russian population; but, having been engaged in traffic throughout the Pacific ocean and having used the Sandwich islands as headquarters for much of their trade, abundant evidences exist of their contact, not only with the Eskimo, but with the Indians of southeastern Alaska. It shows itself in the Polynesian motives on Eskimo carvings and in tools which are evidently of Polynesian origin.

In western United States and throughout the entire Pacific area of Latin America there was constant contact, through the Mexicans, with the colonies of Spain in southwestern Asia and the contiguous islands. Furthermore, when it is remembered that in southern Spain there was an agglomeration of Phenician, Jewish, Arabian, Egyptian, and north African cultures, and that great numbers of Africans were early brought to this continent and mingled with the Indian populations, there is no wonder that the student of technology is constantly at his wits' end to know whether like inventions have been independently worked out, or whether they had a common source. There is no space in this brief paper to discuss this subject, but it is capable of indefinite expansion.

ZOÖTECHNIC PROVINCES

The industries of the American aborigines, in connection with the animal life of the hemisphere, may be divided into zoötechnic provinces.

In a paper published in the Smithsonian Report for 1895, under the title *Influence of Environment upon Human Activities and Arts*, an attempt is made to separate North America and South America into eighteen environmental areas with

reference to all of the activities of industrial life. It will interest the reader to note the close connection between zoölogic areas and Indian stock areas. Indeed, Merriam proposes to include the tribes of men among the animal species predominant in his groupings. For instance, his list for the Arctic is as follows:

A.—Exclusively Arctic

Eskimo	*Homo*
Polar bear	*Thalarctos maritimus*
Barren ground bear	*Ursus richardsoni*
Muskox	*Ovibos moschatus*
Barren ground caribou	*Rangifer groenlandicus*
Arctic fox	*Vulpes lagopus*
Arctic hare	*Lepus glacialis*
Lemming	*Myodes obensis*
Lemming	*Cuniculus torquatus*
Arctic red-back mouse	*Evotomys rutilus*
Parry's spermophile	*Spermophilus empetra*

B.—Common to Arctic and Hudsonian

Wolverine	*Gulo luscus*
Gray wolf	*Canis griseus*
Ermine	*Putorius erminea*

It is not difficult to understand how this came about. Where an animal becomes so necessary to a people that all their activities are in reference to it, they will not wander far away from it; their thoughts will be suggested by it, and even their totems refer to it. If by some stress a tribe of another stock be driven into the area, they drop their old habits and become assimilated to the region.

A good illustration of this is furnished by a story once told by Major Powell, concerning an Indian guide whom he had employed in the mountain regions of northern California. They tramped together for a long time until at last the Indian sat down and refused to go farther. When the distinguished traveler inquired the reason, it was a long while before he got an answer; but finally the Indian said that he had not seen a rabbit for some

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hours. The Major had the sagacity to tell the Indian that he also had noticed the absence of the rabbit and proposed to go back, which the guide was only too ready to do.

Jacob Bægert said of the Indians on the California peninsula: "All of these petty nations or tribes have their own countries, of which they are more enamored than other people of theirs."

From the point of view here assumed these areas may be characterized as follows:

Zoötechnic Areas	Peoples	Predominant Animals
1. Arctic	Eskimo	White bear, muskox, lemming, marine mammals.
2. Canadian	Athapascan	Reindeer, fox, wolf, and other fur-bearing animals.
3. Atlantic slope	Algonquian	Beaver, bear, deer, fox, turkey, fish, mollusks.
4. Louisiana or Gulf	Muskhogean	Bear, deer, migratory birds, and gulf-fishes.
5. Plains of the Great West	Siouan	Buffalo, bear, deer, and prairie dog.
6. Southeastern Alaska	Haida-Tlinkit	Otter, pelagic fish, and aquatic mammals.
7. Columbian region	Salish-Chinook	Mixed aquatic and land animals, wild goat and sheep.
8. Interior basin	Shoshonean	Elk, antelope, rabbit, wolf.
9. Californian region	Very mixed stocks	Inland fish, elk, rabbit.
10. Pueblo region	Tanoan-Tewan and Sonoran	Coyote, mountain lion, and rabbit.
11. Middle America	Aztec-Maya	Lizard (iguana), subtropical animals, and peccary.
12. Antillean region	Arawak-Carib	Rodents, tropical birds, manatee, marine animals, turtles.
13. Cordilleran region	Chibcha-Kechua	Llama, chinchilla.
14. Upper Amazonian region	Jivaro, Peba, Puno, etc.	Birds of beautiful plumage, monkeys, river products.
15. Eastern Brazilian region	Tupi-Guarani, Tapuya	Monkeys, agouti, peccary, tapir, sloth, turtles, fish, mollusks.
16. Mato Grosso and southward	Mixed peoples of Brazilian and Andean types	Monkeys, agouti, peccary, tapir, inland fish, mollusks.
17. Argentina-Patagonian region	Chaco, Pampean, and Patagonian stocks	Vicuña, rhea or American ostrich.
18. Fuegian region	Aliculuf, Ona, and Yahgan	Mollusks and other marine products, formerly seal.

The region gives character to the activity, not only by the species of animals predominating there, but by the abundance or scarcity the year round or at certain seasons.

Coville[1] says: "To a traveler passing across our southwestern desert region it is a matter of great wonder how the Indians of that country contrive to subsist. The question is not what furnishes the best food, but what will furnish us any food."

On the upper Ucayale the savage has not been able to compete with the terrible forces of nature. Animal life is not plentiful, fish are not abundant in the streams, and the power of the native to penetrate the forests is limited owing to the tangled mass of undergrowth.[2]

The same story, only in a different element, would be told by the Fuegians, who, having exhausted the food supply of one cove or inlet, are compelled to go across an intervening bluff to reach the next source of food. For this purpose they have invented a canoe of bark which can be taken to pieces and transported over the mountain on the backs of men and put together again at the next inlet. On the contrary, there were areas in Arctic America, in Bering sea, on the Pacific coast, in the rivers of southern United States, in the Antilles, and on the Amazon, where food was so abundant at certain seasons that the natives were content to live "from hand to mouth." In such cases the great abundance would be an impediment to the inventive faculty, and in the procuring of such supplies the natives did not practice their greatest ingenuity.

DIVISIONS OF ZOÖTECHNY

The study of zoötechny will include the following chapters: I, American Indian zoölogy, or ethnozoölogy in America. II, Exploitive zoötechny—the activities associated with the capture and domestication of animals. III, Elaborative zoötechny—the activities practiced on the animal after capture. IV, Ultimate products of zoötechny and their relation to human happiness. V, Social organizations and coöperations. VI, The progress of

[1] *American Anthropologist*, vol. V, p. 351.

[2] Church, in *Proc. Roy. Geog. Soc.*, London, 1892, vol. XIV, p. 397.

knowledge in zoötechny, including the growth of language. VII, Religion and the animal kingdom.

I. AMERICAN INDIAN ZOÖLOGY

In one form or another the entire fauna of each region directly or indirectly enters into the life and thought of its peoples. There are desolate places where it requires the coöperation of all the animals to keep the population alive; also there are idiosyncrasies of men in relation to animals that have no ethnic significance. It is not designed here to make such a wide inclusion. As there are creatures innumerable which are not amenable to domestication, there are also hosts of them which do not even come into general notice. It is not here concerned with what this or that man ate or wore, but in each tribe with what they all busied themselves habitually. The naturalist, on this count, would enumerate, for each area, a long list of invertebrate creatures, of fishes, reptiles, birds, and mammals; but the Indian would not go above a hundred species, and could count his chosen friends on his fingers and toes. It is this favored few, everywhere, that contribute the material for the study of zoötechny. If possible, the zoölogy of the region as it is recounted by the savage should be worked out. Finally, there are certain animals, such as foxes, wolves, and bears in North America, and the puma in South America, which wander over entire continents as freely as man himself.

The Smithsonian Report for 1887 (pp. 452–454) gives an extensive list of the animals which enter into the industrial life of the Eskimo in Greenland. The Labrador tribes subsist on the reindeer, porcupine, goose, duck, ptarmigan, and hare; they procure fur from the marten, mink, beaver, muskrat, lynx, wolverine, wolf, fox, and bear (Turner).

At Point Barrow, Murdoch studied the animals which were the natural resources of Eskimo art in that region.[1] Bishop

[1] *Ninth Ann. Rep. Bureau of Ethnology*, 1887–88, p. 55.

Bompas details the animals hunted by the inland tribes of Alaska and Arctic America.[1] A list of the food fishes of all the Alaskan Eskimo is given by Bean,[2] who says that every grown male native of Alaska is a fisherman. "Women and children help to increase the stores for winter, taking away great strings of salmon caught in the seines." The standard food fishes of the northern Pacific coast are salmon, herring, candle-fish, cod, and halibut; but these are supplemented for various purposes by a number of other animals.

In northwestern Canada, according to Whitney,[3] the Chipewaian have abundance of fish in the rivers; on the river banks, fisher, otter, mink, beaver, and muskrat; and in the forest, moose, caribou, bear, mink, fox, wolf, wolverine, marten, ermine, and rabbit; in the spring and autumn, migratory birds. George Gibbs[4] furnishes a list of the foods of the people of British Columbia, Vancouver island, and the Straits of Fuca. They do not differ materially from those farther north. Lucien Carr[5] has gathered accounts of game formerly taken by the tribes in Virginia and other southern states. This paper is an exhaustive resume of the bibliography relating to this subject. An excellent account of the animal life with which the Indians of Guiana and Venezuela were familiar is given by Everard F. im Thurn.[6]

The Yahgans of Tierra del Fuego hunt and fish; their animals are principally sea birds, otter, seal, and whales, besides a number of marine invertebrates (*Hyades*). Old voyagers speak of the abundance of seal and other sea mammals about Tierra del Fuego. The destruction of this animal food supply is post-columbian.

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[1] *Northern Lights*, London, p. 182.

[2] *The Fisheries and Fishery Industries of the United States*, Washington, 1887, pp. 101–102.

[3] *Harper's Magazine*, 1896, p. 360.

[4] *Contributions to North American Ethnology*, vol. I, p. 195.

[5] *Proceedings of the American Antiquarian Society*, vol. X, p. 184.

[6] *Among the Indians of Guiana*, London, 1883.

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A careful study of this wholesale destruction of animal life goes far to explain how, with such meager apparatus of stone and wood and animal integuments, the savage could live; it further explains the later migrations of tribes to regions far away from their priscan homes. Like the lonesome guide of Major Powell, they missed their totemic friends and were driven to seek new ones.

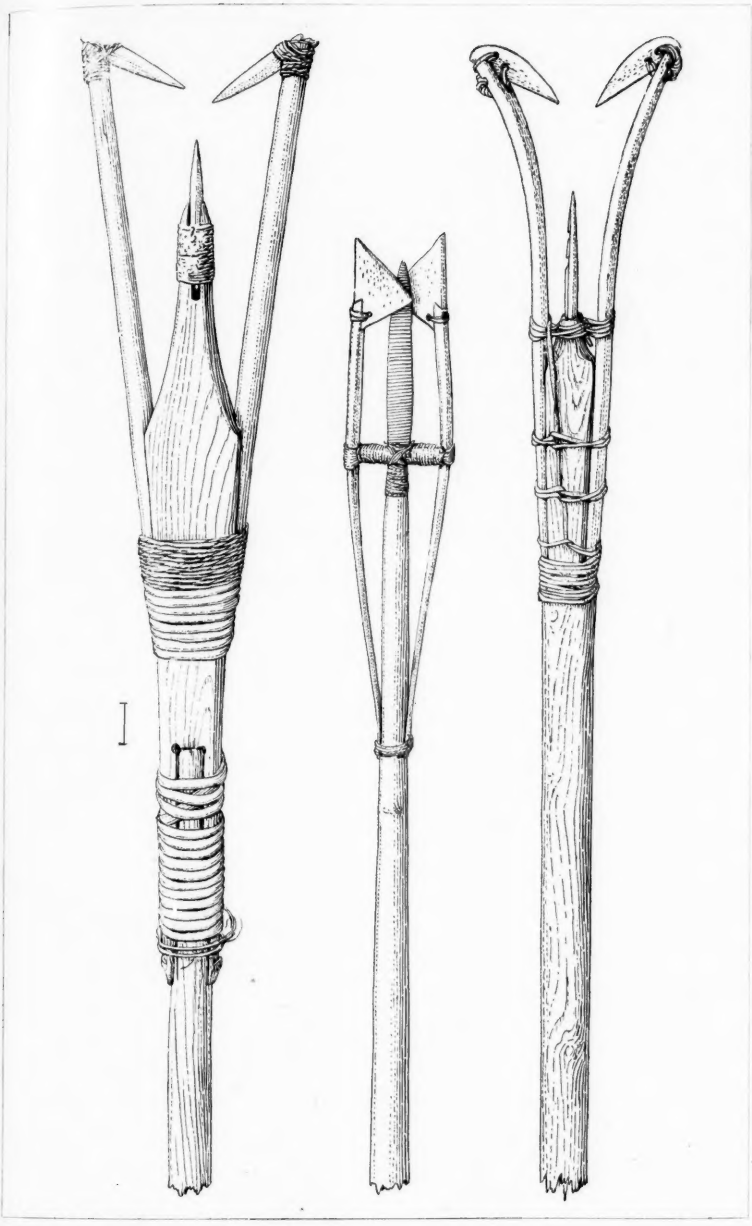
II. THE CAPTURE OF ANIMALS

METHODS OF CAPTURE

The taking of animals from the hand of nature concerns itself with the atmosphere, the earth, and the waters, and the occupations associated therewith go by the general names birding or fowling, hunting, and fishing. These terms are not to be interpreted here except in the most general way. So little is done by savage people in the way of gathering animals from the air, that this chapter will be concerned largely with terrestrial and aquatic capture. The industries associated with capture begin with very simple methods and end with most complicated practices, and in a general way they may be set forth in the following order:—

1. Gathering or taking with the hand without implements.
2. Gathering with devices.
3. Striking, stunning, bruising.
4. Slashing with edged weapons.
5. Piercing with a great variety of implements.
6. Taking in traps and blinds.
7. By means of dogs or other hunting animals.
8. With fire.
9. By means of drugs.
10. The whole class of accessories to the hunter.
11. Domestication, the raising of animals in captivity.

The progress of invention, which is the main idea here involved, has proceeded in every class from what Professor Rouleaux calls naturism to manganism, from simplicity to complexity, from individual effort to coöperation, from hand-worked devices to those mechanically and automatically worked, and frequently



LEISTERS: COMBINATION STRUCTURE FOR GRASPING, PIERCING, AND RETRIEVING, FROM ALASKA

National Museum, Nos. 23,518, 29,864, and 49,051. Collected by Swan, Turner, and Nelson

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results in the compounding of several mechanisms or methods into one. (See plate I.)

THE FIRST METHOD OF CAPTURE

In all the areas mentioned the simplest and easiest method of obtaining animals and animal products is with the hand. In all of them there is some form of animal life or production which the Indian might have by simply reaching forth to take it in the same way that he gathers the fruits of plants, frequently eating forthwith what he has obtained. Indeed, many of these methods of harvesting animal life have been prolonged into civilization. We are accustomed every day to eat or to utilize, in some way, molluscan life, to hunt cochineal, bird eggs, turtle eggs, and other materials, which have been procured by simply taking them up. From this most simple operation, which is practiced in common with our friends the animals, the taking by hand passes through a series of operations which become more and more difficult and require greater and greater skill. All parts of the body are laid under tribute. The man cannot fly, but he must learn to run, climb, swim, dive, go stealthily, becoming the apt pupil of the natural pedagogs, the animals.

These operations may be arranged in some such series as the following:

1. Taking up and using on the spot.
2. Gathering and carrying away to consume.
3. Selecting and differentiating for use.
4. Pursuing and capturing.
5. Climbing and capturing.
6. Swimming and capturing.
7. Diving.
8. Stealing upon.
9. Deceiving.
10. Maiming and killing in capture.

In all of these methods skill and prowess are required. Much knowledge concerning the mental processes of the animals themselves is attained, but this will be discussed in a future section.

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Among the Eskimo of Hudson bay, Captain Spicer saw a man catching by the flippers a full-grown seal as the latter was escaping into the water. The seal caught its forelimbs over the edge of the ice so that the Eskimo could not draw it back. The hunter, however, turned the seal quickly on its back, dragged it to the shore, and dispatched it in a trice.

Dr Boas saw the Eskimo of Baffinland building a flat snow-house for the purpose of catching gulls. One block of the roof was translucent, permitting the hunter inside to push his hand through, and when the bird alighted he had only to seize it and pull it through by the feet. The very same process is described by Stephen Powers: In northern California the top of the blind is a brush, to which a dead bird is fastened. As soon as a hawk alighted it was dragged through the brush and his breast crushed between the knees of the hunter.

The Eskimo of Cumberland gulf trample down the houses in which the young seal are born and drag them forth, crushing them to death.

Both the Aleutian islanders and the Fuegians feed on the echinus, or sea urchins, inside of which lie leaf-like masses of ovaries filled with minute eggs. They are eaten raw, and furnish food supply the year round. The Aleut take mussels (*Modiola* and *Mytilus*), which grow about their islands to an enormous size, also sea-bird eggs in great abundance, and they are thankful for a stranded whale.

All along the north Pacific coast fish-spawn is collected from boughs of evergreen stuck in shallow water. When the boughs are withdrawn loaded with spawn they are transported to the hut, where they are hung up, the eggs being devoured as wanted. On the coast of British Columbia the oolakan are so abundant that both men and animals scoop them out of the water. Along the bays and seacoast of Oregon and Washington and the eastern portion of United States, as well as on parts of the coast of South America, shellfish existed in the greatest variety and abundance.

Vast quantities of them were gathered and eaten, leaving immense shellheaps. The Makah Indians of Washington gathered bivalves, barnacles, holothurians, periwinkles, and limpits with the hand, without apparatus, and smoked them and dried them for winter.

There are tribes of Indians on the western coast of United States who catch turbot and flounders with their feet. Wading slowly into the pools, the Indian feels the fish with his feet, and instantly stepping upon it, holds it firmly enough to reach down with his hands and toss it out. Swan says that a large number engage in this sport, and their splashing, slipping, screaming, and laughing make a merry noise.

According to Powers, the Wintun Indians of California dive many feet for clams; they remain down a long time, and rise with one or more in each hand and one in the mouth.

The Big Meadow Indians of California, in order to procure worms for bait, gather their families upon a damp piece of ground, where they dance and sing until the worms seek refuge in the open air, and are gathered with the hand.

The Wailaki of California capture deer by running them down afoot. The deer follow certain trails, and the Indians post relays of men along these, and so give the animal continual chase until he is so blown that he either stands at bay or takes to the water. They also capture rabbits by running them down. They terrify the animals by beating the bushes and screaming until they are easily overcome.

The Micmac Indians of Nova Scotia will run down a stag, commencing early in the day and following it without intermission. The stag outstrips his pursuer at first, but is afterward captured with comparative ease.

According to Adair, the Choctaw caught catfish with their hands. The Yeguases, Davis says, were fleet runners, able to run down a deer, in which manner they frequently caught them. Professor McGee tells of Seri boys who run down flocks of birds, rab-

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bits, and other swift animals, bringing contempt on themselves if they fail. The Pueblo Indians frequently chase and capture cottontail rabbits without weapons of any sort.

Lumholtz says that in warm weather the Tarahumari catch fish with their hands in the crevices of the rocks, and pursue deer in the snow day after day until the animal is cornered. These Indians are among the most famous runners known to us.

The natives of the Antilles are said to have stolen on fish, concealing themselves among the rocks and sea plants, then seizing them with their hands. The Macusi Indian of Guiana dives from his canoe after a particular kind of fish, chases it to the bank, drives it into a hole there, seizes it with his hands, and brings it up. The Mura of the Amazon, according to Bates, dive for turtles and catch them by the legs. Especially is this true in the lakes where they are imprisoned during the dry season.

The distribution of this method of capture is almost universal in both Americas, and is sufficiently exemplified in the foregoing examples.

In hand capture, death is produced by simply removing the animal from its environment. Few savages swallow their animal food alive. Aquatic animals are asphyxiated and killed in the catching of them. Often aquatic mammals are killed by drowning—by holding them under water until they succumb. Burrowing animals are suffocated by simply burying them alive.

SECOND METHOD OF CAPTURE

The second method of taking animals involves some sort of device or mechanism for seizing. Such inventions are more or less substitutes for or accessories to the human hand and fingers. When the hand is held with the palm upward, it is a scoop; the fingers are a rake; the forefinger is an excellent and versatile hook; the closed fingers and hand hold fast and arrest, and the heavy fist or heel of a fisherman is no mean club. It is the inventor's design to imitate them. (See plate II.)

EXPLANATION OF PLATE II

a. Harpoon head for retrieving, showing toggle and barb types in one. U. S. N. M., No. 89,379. Collected by P. H. Ray.

b. Fishgig; shank, body, and flukes of bone. U. S. N. M., No. 30,407. Collected by E. W. Nelson.

c. Fish-hook from the Naskapi Indians (Algonquian) of Labrador; shank, of wood, split at the lower end to receive the fluke of bone; line of baliche. U. S. N. M., No. 89,977. Collected by Lucien M. Turner.

d. Throwing-sticks and stunning-darts from Xingu river, South America. (After Von den Steinen.)

e. Bird dart, for piercing and entangling, and throwing-board of East Greenland Eskimo. U. S. N. M., No. 168,974. Collected by Capt. G. Holm.

f. Modern atlatl or throwing-stick from Lake Patzcuaro, Mexico. U. S. N. M., No. 153,020. Collected by Capt. John G. Bourke.

g. Hide scraper, with blade of glass and grip of wood, from the Tehuelche Indians of Patagonia. U. S. N. M., No. 178,403. Collected by J. B. Hatcher.

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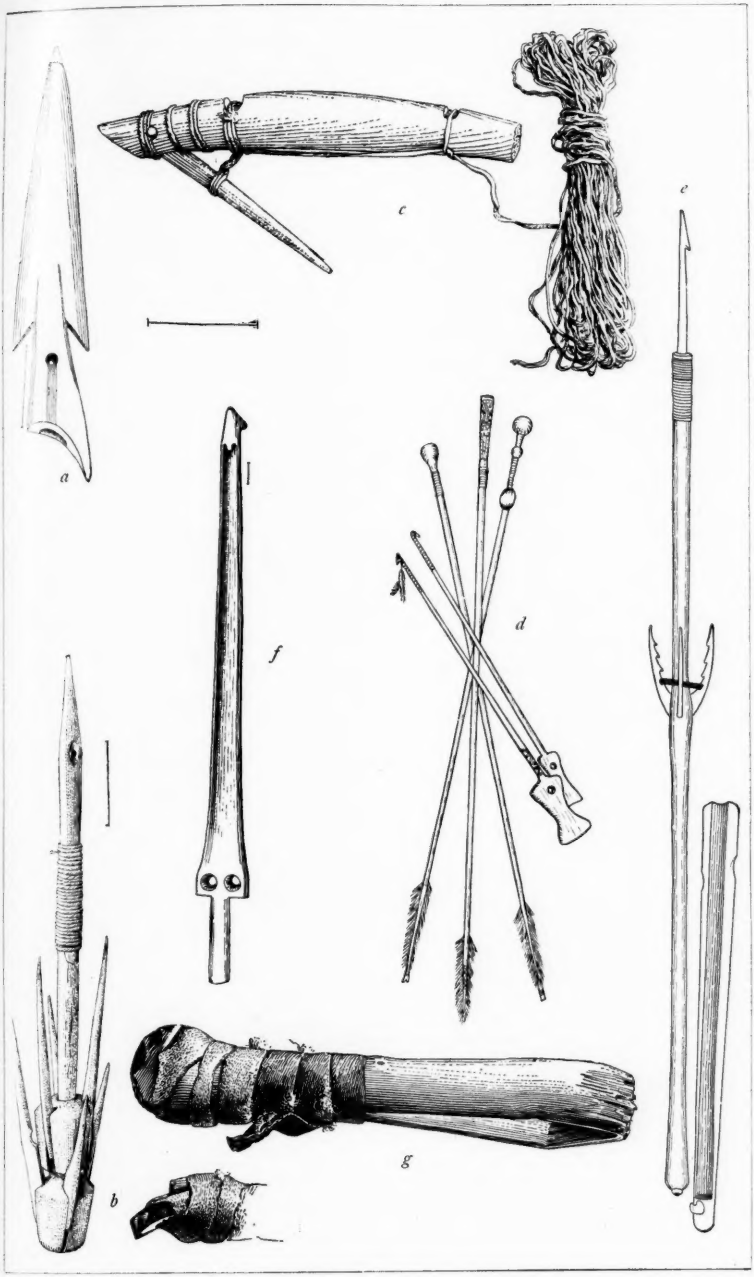

ZOÖTECHNIC IMPLEMENTS

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Of the seizing, as well as of other methods of capture, there are varieties based on the fact of distance between the hunter and his game.

The first or primitive variety of seizing apparatus is held in the hand without any attachment of the shaft or handle whatsoever. Professor E. Krause mentions the fact that the Lengua Indians in the Gran Chaco, South America, wrap around the hands a band, to which short, hard spines of fish are fastened. As soon as the hand is closed these spines pierce the skin of the game and prevent its slipping away.

The second variety or class is fitted upon the end of a handle or shaft or thong, of varying length, always having at the working end a hook or loop or other device for retrieving (plate II, *a*).

The third variety is thrown from the hand and has connected with it a retrieving line.

The fourth variety is thrown by means of a throwing-stick or amentum, and is either attached to a retrieving line or is associated with a bow of this class. Many of these retrieving devices, however, are compounded with methods to be discussed later.

The fifth variety of harvesting apparatus of this kind would be discharged from a bow. Associated with the bow will be a retrieving arrow attached to a line by means of which the game may be recovered, as in the Eskimo muskrat arrow.

The most simple kind of taking by hand through devices would be an imitation of the open hand or double palm. The second would imitate the open fingers, used as a rake. The third would take the place of the forefinger or of the bent fingers, acting as hooks. The fourth would act in the way of seizure. All of these pass through grades of evolution or elaboration, becoming more and more complicated as the capture becomes more difficult; and also the classes of inventions herein included will exhibit the varieties of application just mentioned.

As the scarcity of game, even among savages, made the

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distance greater between it and the hunter, making necessary the development of different kinds of taking, so the noise and terror that came with the gun were the death knell of savage inventions, since they remove the animal out of the reach of all savage weapons.

Scooping devices imitate the open hand or the two hands held together. The dip-net in its multifarious forms is a mechanical realization of this idea, although it is well known that baskets, mats, and all sorts of vessels were used for the purpose of scooping fish from the water when the schools were passing over shallow places. It is a matter of doubt whether nets of this kind were used extensively in America prior to its discovery. Hearne says of the Eskimo that "no appearance of nets was discovered there at their tents or any other part of the shore." Mackenzie, however, declares that the Chipewaian took the beaver in nets, and Schwatka pictures an Aiyan Indian of the Yukon drawing a fish into his canoe with a dip-net.

The Indians of southern United States are declared to have had nets of hemp, and Mr Cushing dug from the muck beds of San Marco, Florida, dip-nets of fine mesh.

At Cook's inlet the Kenai erect stages over the water and dip up salmon in baskets. Swan asserts that among the Indians of Washington the knowledge and use of the net antedate the first white man. In Nootka sound shoals of sardines are driven into the coves and shallow water and scooped up with wooden troughs and wicker baskets. The Modok Indian drags a scoop-net at the stern of his canoe, and when the catch is sufficient, the net is emptied by the fisherman.

The Mission Indians and other tribes of California caught jack-rabbits in nets. The Concow use the same apparatus for catching grasshoppers, of which they are very fond.

Small hand-nets are described as in use by the natives of Xingu river in South America. The Peruvian coast Indian drags a net at the stern of his balsa.

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Indeed, some variety of this method of taking game is universally practiced throughout the two continents.

Rake devices imitate the fingers half bent, and are used in gathering mollusks. In several parts of America rakes were made by driving bones into handles, and thus animals were gathered. In many of these, piercing and also retrieving functions are superadded to that of gathering.

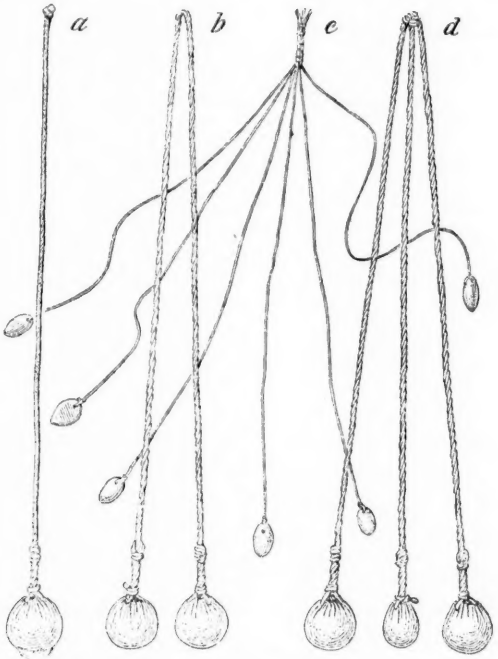

FIG. 1—*a*, *b*, *d*, Bolas for ostrich and guanaco, from Patagonia (U. S. N. M. No. 130,503; collected by Leslie Lee); *c*, Bolas for water birds, from Alaska (U. S. N. M. No. 75,969; collected by P. H. Ray).

The hook resembles the bent finger or fingers. This device has called forth a great deal of ingenuity. Commencing with the crooked finger, there comes the hand aided by the short hook; the gaff hook; the hook at the end of a string, or squid hook;

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baited hooks; barbed hooks; compound hooks; automatic hooks; accessories to hooks, such as lassos, sinkers, triggers, etc. It is impossible here to enter into the distribution of this vast collection of material in precolumbian times. It must not be overlooked, however, that angling became vastly more complicated after foreign contact. (See plate II, *b*, *c*.)

Gripping devices imitate the closed fingers or closed hand, and they are represented by all kinds of lassos, bolas, chokers, and hand nooses; not traps, which belong to an entirely different class. The leister is a gripping device to which the function of seizing is added. In some forms this class has a distribution which is not fully worked out. For instance, bolas exist among the bird-eating tribes of Alaska and the guanaco-hunting tribes of southern South America (figure 1, page 59). In colonial times trout-noosing existed in the eastern part of the United States.

Birds are caught in California by a running noose at the end of a pole. The Panamint Indians of California seize lizards in this way, and Rochefort describes a " gin having a running knot which is fastened to the end of a pole and cunningly got about the necks of the iguana lizards in order to get them out of the trees."

The distribution of the lasso is yet to be determined.

THIRD METHOD OF CAPTURE

The third method of taking animals is by striking or crushing. In its simplest form it involves only the use of the human body—the fist in striking, and the knee, the heel, or rolling stones in crushing. With increasing difficulty of capture this process is followed by striking with a weight in the hand, with a club, with a sling-shot or *bola perdida*, with a dart-sling or throwing-stick, with a sling or stone-bow, and with a blunt arrow. The beginning of such a series would be the fist, and the termination, the cannon-ball. Among traps the dead-fall occupies the same position.

In the Arctic regions, and, indeed, one might say universally throughout America, the club is an implement of capture either

alone or in connection with other implements. In some areas the club is an unadorned killing device, in others much skill is expended on it in decorations that are either totemic or sorcerous, and in its most efficient form it cuts or pierces as well. Throughout the buffalo country a peculiar form of club prevailed, and it is still seen, by the way, down to the borders of Mexico. A ball of stone is enclosed in a rawhide bag which is loosely attached to a short handle, after the manner of a flail.

On the western coast of the United States the sling begins to appear. Powers says that the Copehan tribes killed wild fowl with a sling, using bolas made of hard-baked clay. Ray also brought the sling from this region.

All over the southwestern country the non-returning boomerang is common. Lumholtz says the Tarahumari Indians kill birds with stones.

Gemelli Careri says that the Indians "kill" small birds on the highest trees with pellets shot out of trunks. The sling, however, had its greatest use and distribution on the cordillera of South America. The tribes of the Mato Grosso used a stunning dart with their throwing-sticks. Stunning arrows, sometimes bird arrows with blunt heads, are found all the way from the Arctic Eskimo to Argentina (plate II, *d*). Wells mentions the use of the sling in Tierra del Fuego.

FOURTH METHOD OF CAPTURE

The fourth method of taking animals is with an edged weapon. The sword is the acme of all such inventions. In the almost entire absence of wrought metal, throughout America, slashing weapons were of stone, bone, or hardwood. The rapidity with which natives in all parts of this hemisphere adopted the use of iron and steel prevents the present examination of the method of using the primitive edged tools. However, there is no spot on either continent, where available material is to be found, that does not reveal the universal use of the hunting knife. The sim-

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plest example of this in the National Museum has a leaf-shape, chipped blade, one end of which is wrapped with a long strip of otter fur to serve as a handle.

Departing from this starting point, it is easy to trace the edged weapon through the knife, the American form of the *pattu pattu* or stone swords, the style common among the Sioux and in Mexico of inserting blades into a club.

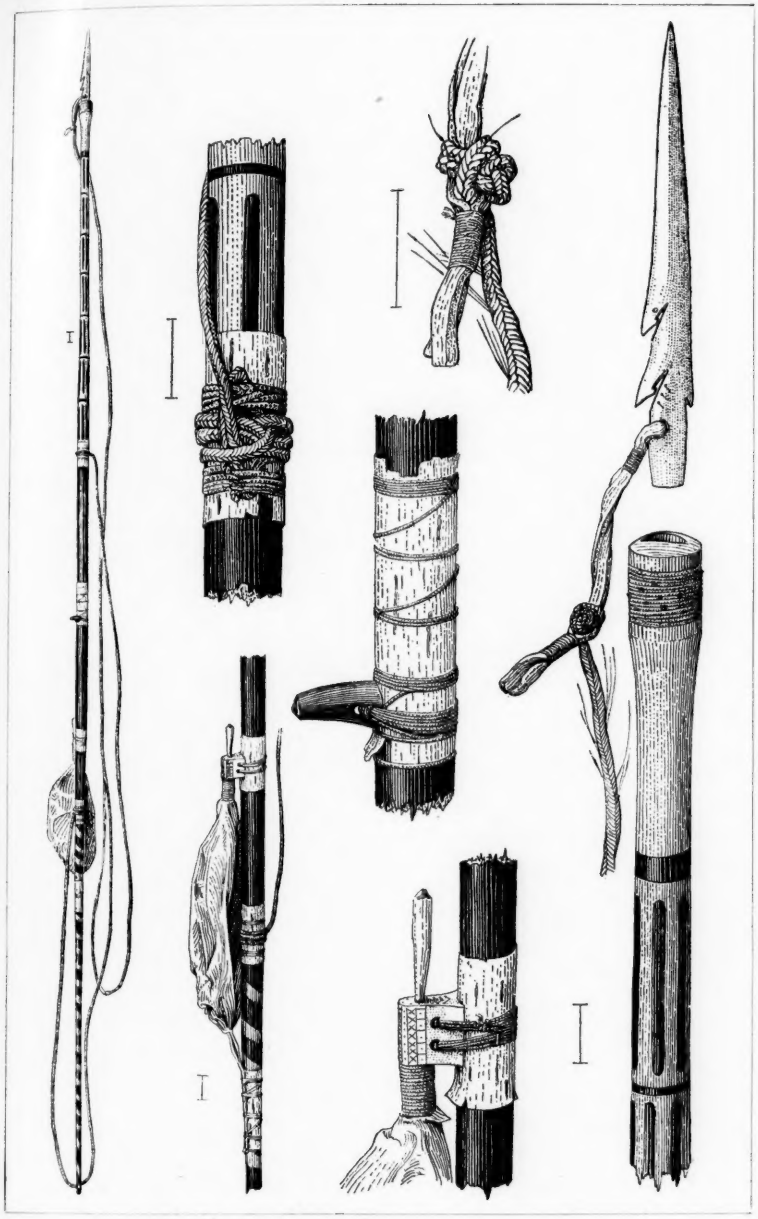
The *macana*, described by Hawkins, in 1593, as "a sword of heavy black wood some four fingers broad, an inch thick, and an ell long, something broader at the top than at the handle," has wide distribution in South America. The edged or cutting arrow, common in various parts of the eastern hemisphere, is not known to have existed in America.

FIFTH METHOD OF CAPTURE

The fifth method of taking animals is with some piercing device. These devices are far more numerous than those employed in all the other methods, and have been subject to the widest differentiations of form and complexity of development. A full discussion of those on the American continent would far transcend the limits of this paper.

Piercing devices begin with a thorn or sharpened bone held in the hand. When the point has a short handle, it is a dagger; when it has a long handle, it is a lance; if the point is barbed for retrieving, it becomes a spear; when shot from a bow, it is an arrow; when hurled from the hand or throwing-stick, it is a dart; when it has a detachable point, it is a harpoon, and these may be either barbed harpoons or toggle harpoons. Above these simple forms there are many that involve two or more of the processes named. A great many of them serve the double purpose of piercing and retrieving. (See plate III.)

The lance was used anciently for stabbing, and it could be withdrawn; it exists with a point or blade of chipped stone, bone,



BARBED HARPOON

Barbed head and hand-rest of bone; long-shaft of wood; line of sinew; float of seal bladder. When the animal is struck the barb is detached and the shaft is made to float vertically by the martingale and bladder. (U. S. N. M., No. 11,362. Collected by Vincent Colyer.)

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or shell, or with one hardened by fire. Every Eskimo kaiak has among its multifarious accouterments a large stabbing lance which may be driven again and again into the seal or other animal. The western Eskimo have a form of lance with detachable points that are left in the animal. Each hunter carries a bag of them, and when he comes in close quarters with a walrus or other game, he plunges one after another into the beast until it is killed. Blades of iron have universally taken the place of stone and other substances. The Cree Indians extemporize a lance by lashing a hunting knife to a long pole. On the Mosquito coast the turtle is struck with a lance having a point like a file and without barbs. A spear in this connection is a lance with barbs on the point, and the bird, mammal, or fish is transfixed and retrieved.

In the Eskimo area the bird-spear, so called, exists universally; that is, the points at the working end are barbed, and there are barbed pieces also on the sides. These perform the function not only of transfixing, but, as mentioned in a former section, of entangling and grasping. The fish-spear exists in great profusion throughout Eskimo territory where fish are in abundance and may be captured by spearing (plate II, *e*).

An interesting group of devices for piercing are the bows and arrows. The following table will set forth the types of these weapons in the areas named:

1. Arctic area; compound bows in the east, sinew-backed bows in the west.

2. Athapascan area; long, straight bows of willow and birch with wristguard on the bow.

3. Algonquian-Iroquois; plain or self-bow of hardwood—ash, hickory, osage orange, and oak.

4. Muskhogean bow; long, with rectangular cross-section, of walnut and other hardwood.

5. Rocky Mountain bow, in two varieties—plain or self-bow of Bois d'Arc, and a compound bow of buffalo horn in two or three pieces, wrapped and strengthened.

6. North Pacific bow; round grip and flat wings, generally of yew or cedar.

7. Columbia River bow; similar to number 6, with wings much shorter and the necks sharply incurved.

8. Interior Basin bow; a long, slender stick, lined on the back with shredded sinew, strengthened by cross-wrapping here and there.

9. California bow; like number 7, but neatly lined with sinew and ornamented.

10. Pueblo bow; like number 8, but frequently without backing. In the southern portion of this area long cottonwood bows with cross-lashing are used by the Yuman and Piman Indians.

11. Middle American bow; hard palm wood, long and rectangular in cross-section; in the northern portion, short and flat.

12. Antillean bow. Little is known of this type, but probably it resembles the types of the Venezuela and Guiana regions, which are long and slender.

13. Cordilleran bow. Wherever the sling was predominant the bow was not much used, and this is true of the highland regions of South America. The Amazonian type intrudes here.

14. Upper Amazon bow; of palm wood, rectangle or long ellipse in section.

15. East Brazilian bow; of hardwood, semicircular in section, mixed southward.

16. Mato Grosso bow; bows of the east and west overlapping.

17. Argentina bow; of hardwood, small, round in section, disappearing after the introduction of the horse.

18. Fuegian bow; round in section and small.

No less interesting than the bow is the arrow in its geographic distribution throughout the western world. On the whole, the structure has not been materially changed by the introduction of metal, iron and brass taking the place of stone and other substances.

1. Arctic arrow. In the treeless Eskimo region the arrow-shaft is made of driftwood or of small pieces from wrecks spliced together and tipped originally with bone, most of them being barbed either for deer hunting or for fishing.

2. Athapascan arrows differ a little from Eskimo arrows, especially those that are designed for killing caribou.

3. The Algonquian arrow had a simple shaft (but no foreshaft), feathers, and head of chipped stone, fastened on the top with sinew; but in the fishing regions all sorts of barbed pieces replace the stone, each having one or more barbs.

4. The Muskhogean arrow was made of reed cane, and had wooden as well as stone points for different purposes.

5. The Rocky Mountain arrow has a short, hardwood shaft with blood streaks, and formerly a head of stone, but this is now replaced universally with iron.

6. The North Pacific arrow has a shaft of cedar with two flat or three radiating feathers, and a head of bone or iron. These are better made than the arrows of the Eskimo.

7. The Columbia River arrow is neatly made with a shaft of cedar and a head of two or more prongs, usually barbed.

8. The Interior Basin arrow resembles that of the Rocky Mountain region, though on its western side it merges into that of the Columbia River region.

9. The California arrows differ in special characteristics from place to place, but all are delicately made with light shaft, hard foreshaft, fine obsidian or stone point, and three feathers, usually highly ornamented.

10. Of the Pueblo arrows there are two kinds—those made under northern influence have a single shaft, while those made under southern influence have a reed shaft and hardwood foreshaft with points of stone or glass.

11. The Middle American arrow is long and has a shaft of reed with flat feathering.

12. Antillean arrow. According to Hermann Meyer the arrows

of the southern region are best distinguished by their feathering. In the Guiana foreshafted arrow there are two short half-feathers bound to the shaft with seizings of fine thread. This is also the region of the blow-tube and curari poison.

13. Cordilleran arrow. Where the arrow exists in this region the feathering resembles that of the next group.

14. Upper Amazon arrow. Two feathers attached to the shaftment with black cement and held in place by a spiral winding of thread.

15. Eastern Brazilian arrow. Two whole feathers fastened by their ends with thread or bast frequently laid on in patterns.

16. Mato Grosso arrow. Great confusion of arrows of different types.

17. Argentina arrow. Two feathers wrapped and cemented.

18. Fuegian arrow. Diminutive arrow with very short feathering and delicate point.

The blow-tube is a tropical invention confined to areas where the cane abounds and also where bows and arrows are not serviceable weapons. The two areas of its full development are South America and Malaysia. The weapon consists of a straight tube of cane and a short arrow; at the base of the latter wadding is wrapped. Frequently the points of the little darts are poisoned.

The weapon of the western continent is somewhat better adapted to wooded regions where abound monkeys and birds of beautiful plumage. It is found sparingly in southern United States. The Chetimacha of Louisiana used a compound weapon in which four or more tubes were lashed together as in a pan-pipe.

In Venezuela, Guiana, and eastern Brazil abound the *zarabatana* (also called *gravatana*) and *pucuna*. They are mentioned by E. F. im Thurn, Schomburgk, Wallace, Simpson, and Bates. The Caribs insert a tube of palm wood into a stem of *Arundinaria schomburgkii*.

Instead of reeds the Napo Indians use a tube made in the following manner: A good piece of *chonto* palm, the hardest palm found in the country, is selected and a groove cut into it with a knife, to the length of about 7 to 9 feet. This groove is then scraped and rubbed with sand, finer and finer, until it assumes perfect smoothness. Another half tube, exactly similar, is made, and the two are then bound together with wax and fiber, the result being a long, heavy pipe with a bore about three-eighths of an inch in diameter, which on examination proves to be almost as true and polished as a gun barrel. Through this the insignificant though deadly poisoned-tipped darts are blown with unerring precision, conveying silent and sure death to their mark.

Next to the bow and arrow the most complicated piercing weapon for hunting is the harpoon, which may be described as a retrieving spear with a movable head. It may be either barbed or toggled. The barbed harpoon is universal in America, and the toggle exists in some areas in a very simple form; but the whole outfit of the Eskimo in the use of this apparatus, and the apparatus itself, form a most intricate device for hunting.

From old graves in Greenland and other Arctic areas toggle heads have been found which show the transition from the barbed head to a very simple form of the toggle. Examining these in comparison with the latest forms proves that Siberian, Russian, and European influences have combined with Eskimo ingenuity in developing the modern form. Even for this most improved type there are varieties differing in size, material, shape, and relationship of the parts according to the environment, the animal to be captured, and the intelligence of the maker. So we have whale harpoons, walrus harpoons, seal harpoons, hand harpoons, thrown harpoons, retrieving harpoons, and harpoons with floats.

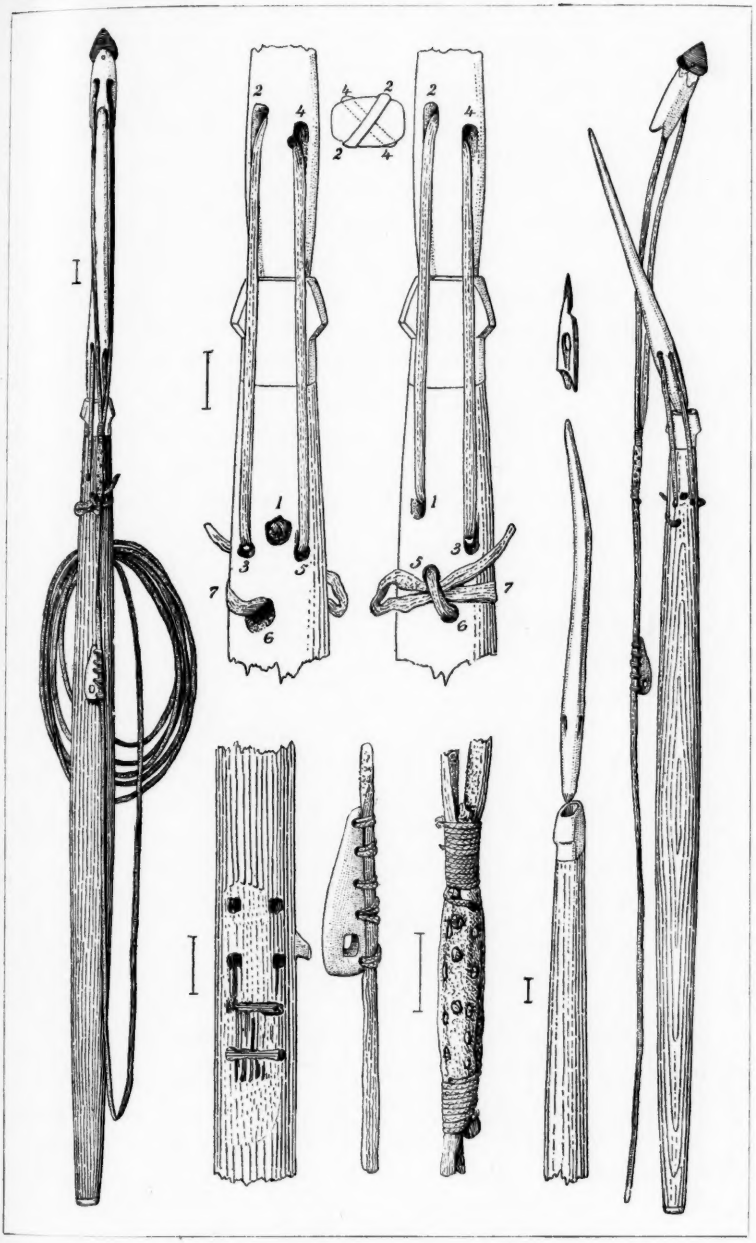
The Giliak long pole and float combined do not extend in America, but eastern Greenlanders have a small sled to carry the point on the ice which corresponds exactly in function with

the Giliak float. They also have a deep-sea harpoon with long shaft, operated by two hunters.

The parts of a toggle harpoon head are the toggle head, the body of the head, the spur, barbs, blade, shaft hole, line hole, grooves, and leader or short line (this works on a loose shaft of varying form hinged to the shaft), foreshaft (which differs in material and shape, joining with the shaft), socket for the foreshaft, and accessories. Shafts differ in material, in length and size, in the number and position of the pegs, in the hand stop or rest, in the laying on of the assembling line and ice pick. Add to this the floats, float rack, and other appurtenances on the canoe or kaiak, and it will be seen how excellent an object for studying distribution and development for technique this weapon becomes (plate IV).

In a more extended work on zoötechny the discussion and distribution of the barbed and toggle harpoons throughout the western hemisphere will be fully set forth.

Closely associated with the harpoon is the so-called throwing-stick, or dart sling, or harpoon sling, or Mexican *atlatl.* It is a piece of wood or reed, the working end of which is a hook of some sort to engage the but-end of a dart or harpoon. Its manual end may be merely rounded for a hand grip, or it may be carefully wrought out to fit the right hand of the hunter. The device practically adds another joint to the hunter's arm. With specific variations it is found from Greenland to Siberia among the Eskimo; it occurs also in southeastern Alaska, down the Pacific coast to Columbia river, among the cliff dwellers of the Interior basin, in the keys of southern Florida, and thence southward through Central America to Colombia, on the upper Amazon, in the Mato Grosso, and in eastern Brazil. In the Report of the United States National Museum for 1883–84 the writer published a paper on Eskimo throwing-sticks, since which time many contributions have appeared relative to this curious invention (plate II, *f*). Among the writers should be named Kristian



TOGGLE HARPOON AND LINE FROM CUMBERLAND GULF

U. S. N. M., No. 19,519. Collected by G. Y. Nickerson

Bahnson, G. W. Lüders, Adrien de Mortillet, John Murdoch, Zelia Nuttall, C. H. Read, Edward Seler, Hjalmar Stolpe, and Max Uhle.

SIXTH METHOD OF CAPTURE

The sixth method of taking animals is classed under the general name of traps. In the second, third, fourth, and fifth methods the animal succumbs to force. The prevailing thought in the mind of the captor is that of seizure and destruction without consulting the desires and idiosyncrasies of the animal; but in the whole class of devices enumerated under the general term traps, the psychology of the victim is seriously considered, and the game is not killed or violently captured, but induced by various deceits of the hunter, who may be absent or concealed, to commit suicide or self-incarceration. In one place the bird comes unsuspiciously to its accustomed roosting-place and is held fast by a bird-lime or a snood encircling its feet.

The whole class of destructive weapons is imitated in the trapping devices; animals are seized by the foot or by the head; they are stunned by a blow; they are seriously cut with a blade; they are pierced in some vital part, or they are induced or driven into an enclosure from which they cannot escape.

Indeed, there is no great gulf fixed between the foregoing classes in which man, as an active agent, is present, and the trap; some of the latter are operated partly by the victim and partly by the hunter concealed, as in the case of the fall trap used by boys for catching snowbirds. The little stick which supports the weight is fastened to a long string that is pulled by the concealed hunter when a sufficient number of birds have come in.

When the minutiæ of the traps are considered, one might almost say that there is a different mechanism for each species of animal. The parts of a trap are, as in tools, the working part and the manual part (or that which takes the place of the human hand), together with such intervening devices as render these coöperative.

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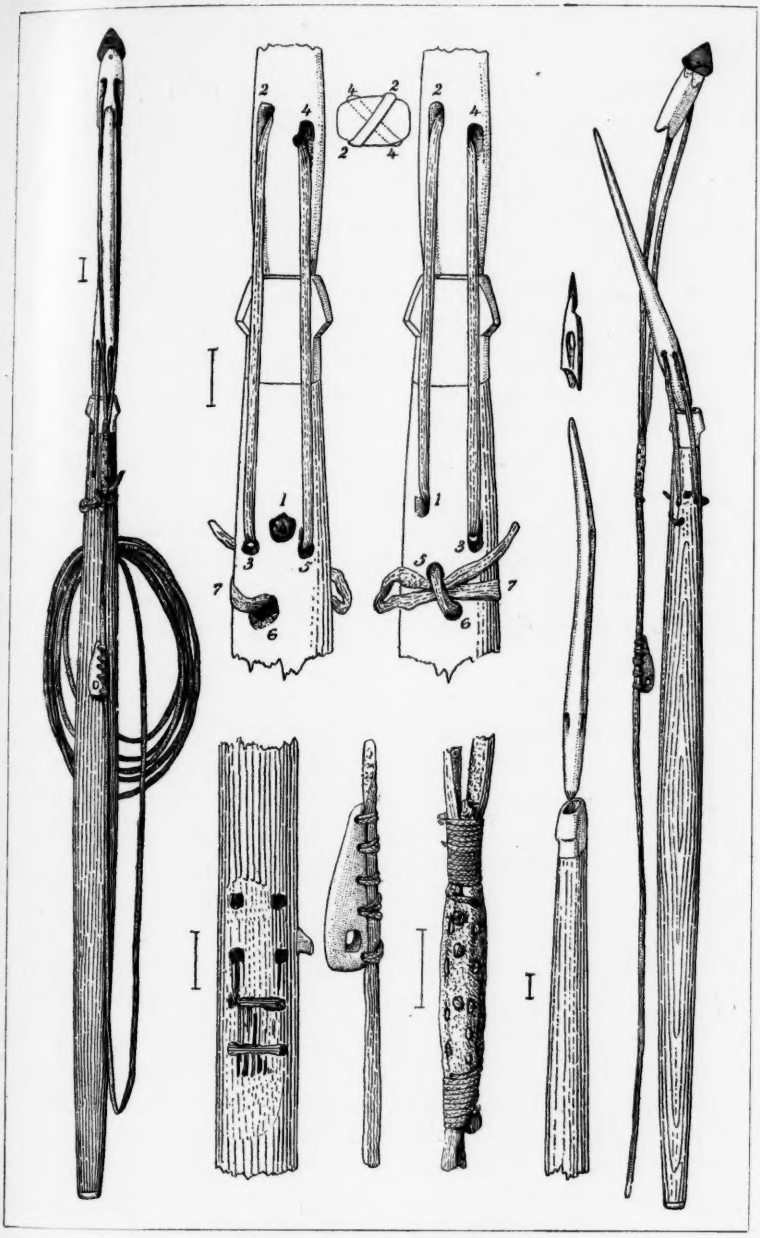
The Giliak long pole and float combined do not extend in America, but eastern Greenlanders have a small sled to carry the point on the ice which corresponds exactly in function with

the Giliak float. They also have a deep-sea harpoon with long shaft, operated by two hunters.

The parts of a toggle harpoon head are the toggle head, the body of the head, the spur, barbs, blade, shaft hole, line hole, grooves, and leader or short line (this works on a loose shaft of varying form hinged to the shaft), foreshaft (which differs in material and shape, joining with the shaft), socket for the foreshaft, and accessories. Shafts differ in material, in length and size, in the number and position of the pegs, in the hand stop or rest, in the laying on of the assembling line and ice pick. Add to this the floats, float rack, and other appurtenances on the canoe or kaiak, and it will be seen how excellent an object for studying distribution and development for technique this weapon becomes (plate IV).

In a more extended work on zoötechny the discussion and distribution of the barbed and toggle harpoons throughout the western hemisphere will be fully set forth.

Closely associated with the harpoon is the so-called throwing-stick, or dart sling, or harpoon sling, or Mexican *atlatl.* It is a piece of wood or reed, the working end of which is a hook of some sort to engage the but-end of a dart or harpoon. Its manual end may be merely rounded for a hand grip, or it may be carefully wrought out to fit the right hand of the hunter. The device practically adds another joint to the hunter's arm. With specific variations it is found from Greenland to Siberia among the Eskimo; it occurs also in southeastern Alaska, down the Pacific coast to Columbia river, among the cliff dwellers of the Interior basin, in the keys of southern Florida, and thence southward through Central America to Colombia, on the upper Amazon, in the Mato Grosso, and in eastern Brazil. In the Report of the United States National Museum for 1883–84 the writer published a paper on Eskimo throwing-sticks, since which time many contributions have appeared relative to this curious invention (plate II, *f*). Among the writers should be named Kristian



TOGGLE HARPOON AND LINE FROM CUMBERLAND GULF

U. S. N. M., No. 19,519. Collected by G. Y. Nickerson

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Bahnson, G. W. Lüders, Adrien de Mortillet, John Murdoch, Zelia Nuttall, C. H. Read, Edward Seler, Hjalmar Stolpe, and Max Uhle.

SIXTH METHOD OF CAPTURE

The sixth method of taking animals is classed under the general name of traps. In the second, third, fourth, and fifth methods the animal succumbs to force. The prevailing thought in the mind of the captor is that of seizure and destruction without consulting the desires and idiosyncrasies of the animal; but in the whole class of devices enumerated under the general term traps, the psychology of the victim is seriously considered, and the game is not killed or violently captured, but induced by various deceits of the hunter, who may be absent or concealed, to commit suicide or self-incarceration. In one place the bird comes unsuspiciously to its accustomed roosting-place and is held fast by a bird-lime or a snood encircling its feet.

The whole class of destructive weapons is imitated in the trapping devices; animals are seized by the foot or by the head; they are stunned by a blow; they are seriously cut with a blade; they are pierced in some vital part, or they are induced or driven into an enclosure from which they cannot escape.

Indeed, there is no great gulf fixed between the foregoing classes in which man, as an active agent, is present, and the trap; some of the latter are operated partly by the victim and partly by the hunter concealed, as in the case of the fall trap used by boys for catching snowbirds. The little stick which supports the weight is fastened to a long string that is pulled by the concealed hunter when a sufficient number of birds have come in.

When the minutiæ of the traps are considered, one might almost say that there is a different mechanism for each species of animal. The parts of a trap are, as in tools, the working part and the manual part (or that which takes the place of the human hand), together with such intervening devices as render these coöperative.

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Many additions to the language have been made by the trapper, such as springe, snare, gin, pit-fall, dead-fall, gill-net, noose, enclosure, pound, creel, weir, and others.

There is also an opportunity in this division of the subject to study elaboration or perfection. For instance, among the most primitive people exist forms of driving animals into some sort of a corner, or enclosure, or pit, or body of water, and even fishermen construct rude fykes and fish traps into which large numbers of fish are driven, and this finally leads to the development of the regular fykes in our rivers.

The net in this connection has a very extensive development. One form of this apparatus was mentioned in the second division of this subject—the method of taking by hand,—that is, the scoop-net; but the set-net, the gill-net, and the fyke combined gave rise to a great variety of trap structures.

The snare in its simplest form is a noose set in the way of animals that go in trails or paths, but later is manifested by the addition of a spring as in the ordinary rabbit springe of the country boy.

The greatest ingenuity, however, is manifested in the structure of what is generally known as traps. Under this name are included, on the American continent, stomach springs, closing pen-traps, clutching traps, fall traps, cage traps, empalement traps, and missile traps. These may be divided according to the method of preparing them for their work into man-set, self-set, ever-set, and victim-set.

SEVENTH METHOD OF CAPTURE

The seventh method of taking animals is by the aid or help of other animals, either as decoys to lure the victim to destruction, or, as dogs and other hunting animals, to chase down or kill.

The remora, however, used by the people of the Antilles for taking larger marine animals, is a fish which, by means of a sucker, attaches itself to the prey and is retrieved by means of a line

attached to its body. In this case the hunting animal is really a living capture device (second method).

Insensibly, animals in contact with savage tribes enter into the thinking of these tribes. Not only are the people modified because of the existence of the helpfulness of these animals, but the animals themselves become modified and helpful to the people or suspicious of them; their whole conduct is changed.

A story is told of a traveler in the Andes, in company with an Indian guide, being informed of the existence of animals of prey actually engaged in devouring a victim simply by the flight of birds overhead. Examples of this unconscious intercommunication and helpfulness are innumerable.

The one animal that has been most helpful to man on the western continent, in the matter of hunting, is the dog, especially in the Arctic regions.

EIGHTH METHOD OF CAPTURE

The eighth method of taking animals is by means of fire through its phases of heat, light, and smoke. The light of the torch serves a double purpose, it illuminates the area of hunting and confuses or attracts the game.

The Seneka are said to have hunted deer at night in canoes, having a wax candle fastened to the bow. The Indians of Puget sound also used a torch to hunt elk, deer, and waterfowl at night. In the case of the latter they erected tall poles to which nets were stretched; when they held their torches behind the nets the migrating birds would fly against it and fall to the ground. The California Indians, as well as the eastern Indians, fished by torchlight.

Squier describes fishing on the Mosquito coast by torchlight made of bundles of fat pine fastened to the top of a long pole. Indeed, the tropical tribes, especially in the Antilles, were accustomed to use torches in fishing with dip-nets in the rivers at night. It is said that the Indians of Chesapeake bay formerly would light

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torches in their canoes at night, and that the fish, attracted by the light and attempting to jump over the boat, would land inside. At times the fishermen were compelled to put out the light to prevent the fish from sinking the boat.

Fire was used also for burrowing animals out of their dens; but the most exciting and effective use of fire for hunting was by the Indians of the plains of the great west. In their annual buffalo hunts large droves of these animals were corraled by means of fire.

The "Digger" Indians of California employed fire in corraling rabbits. In doing this they also obtained large quantities of grasshoppers, the fire having merely singed their wings. "As the squaws picked up the insects they crushed the head between the thumb and finger to kill them, and then tossed them over their shoulders into their conical baskets." These were used for food.

NINTH METHOD OF CAPTURE

The ninth method of taking animals is by poison. This term is used in a general sense and applies to all methods of capture in which the digestive organs are attacked.

Cabeza de Vaca noted the practice of poisoning in Florida. Adair says that it was general throughout the southern states. Dr Chesnut, of the Department of Agriculture, mentions among the poison plants of southeastern United States a horse chestnut (*Æsculus pavia L.*) used in stupefying fish. The California Indians, when the streams run low and the fish collect in deep holes, cut off the water from above and use soap root which soon causes the fish to float upon the water. The Countess di Brazzà says that the Pima used large quantities of *Sebastiana palmieri* for poisoning fish. Lumholtz makes the same assertion with reference to the Tarahumari Indians of northern Mexico, and Squier gives an interesting description of the poisoning of fish by the Payas of Honduras.

Brinton mentions the Moguexes, in southern Colombia, who

stupefy themselves with stramonium, which they use also in catching fish. The Gentleman of Elvas says that in Peru great abundance of fish were asphyxiated in this way and then killed with clubs. The Indians of southeastern Brazil use a number of leaves, as well as roots and bark, for this purpose. The tribes of the lower Amazon and of the upper Negro poison fish in the same manner. Von den Steinen says that the Xingu tribes do not poison fish.

The use of poisoned arrows by the North American tribes is a mooted question and would not apply to hunting; but in the study of poison in the capture of animals one should not overlook the question of the curari poison in the northern portions of South America, especially among Carib tribes.

An enormous bibliography of this subject is to be found at the Surgeon-General's Library in Washington, and also in the great *Index Catalogue* of that library.

ACCESSORIES OF CAPTURE

Besides the apparatus used immediately by the hunter to kill or to secure his game, there are a thousand and one accessories thought to be indispensable. In the pursuit he modifies his dress or has special cover or protection from the weather.

John Smith says that the Indians carried mats to kneel on in their canoes when they went on hunting expeditions, and when they landed they used the mats to make huts.

Nelson records the fact that the Eskimo of Norton sound carry wooden plugs in their canoes, and when a seal is stabbed the hunter blows up, with his mouth, the skin of the dead animal, and, thrusting one of these plugs into the hole, renders the animal buoyant so that the hunter may tow it ashore.

Every invention designed to assist the hunter in approaching the game, or dispatching it, or carrying it home, or protecting himself, may go under the general title of accessories to hunting. It is quite possible that in this association the invention of fire

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making and of condensed food for long journeys took place. Here belong decoys, ice-creepers, and snowshoes.

In Drake's *The World Encompassed* there is a very vivid description of a rhea hunter who "carries a great and large plume of feathers on a staffe, in the forepart bearing a likeness of the head, and necke, and bulke of an ostrich."

The seal hunter draws his hood over his head, lies down on the ice, and approaches the victim by stealth, taking advantage of its forty winks.

Before the intrusion of the gun there is no doubt that wariness, sound and sight decoys, and disguises of all kinds were in universal use in the western hemisphere. The author has collected a large number of these appeals to the eyes and ears of the game in order to get within reach of the dispatching weapon.

DOMESTICATION

The domestication of animals is not, strictly speaking, a mode of capture, and yet, when the processes by which wild creatures are brought under the domination of man are understood, it will be found that it is a slow and insidious method of capture. In fact, all vermin and other noxious creatures are self-domesticated. The ox, horse, ass, camel, sheep, goat, and hog came to man slowly and in droves. On the western hemisphere they antedated man, existing now as fossils or poorly allied species. Few of these congeners were domesticable. Professor McGee has drawn attention to the subtle manner in which the animals in our southwestern regions have come into diplomatic relations and compromises with the Seri and Papago Indians.

The dog in both Americas, the peccary and the llama in South America, for pets, for hunting, for packing, for travois, or for traction, were the farthest advanced in the school of domestication among the animals of the western hemisphere; but every tribe had, in addition to these, birds and beasts which responded to some desire of the adults or children or have come under their

sway. Among these partially subdued creatures were schools of fishes and herds of ruminants corraled to be killed ad libitum. Around nearly every southwestern pueblo there are cages for the incarceration of wild creatures, and the snakes for their ceremonies are gathered in pits. The Mexicans made special houses for birds and beasts. E. F. im Thurn calls attention to the interminable chatter of pets about the Indian habitations in Guiana, and says the racoon (*Nasua socialis*) is more often seen tame than wild. The peccary was partly tamed both in Mexico and on the Amazon. The whole subject of domestication on the western continent has been laboriously worked out by Payne.[1]

III. PROCESSES IN ZOÖTECHNY

The third division of zoötechny embraces all the activities included in the disposal of animals after they are in hand.

It was mentioned in the beginning of the section on "Capture" that a great many of the animals taken by savages are eaten on the spot, but even of this simple harvest much is carried away, and this involves, therefore, the methods of carrying in use from region to region, and hence the vast array of transportation utensils. On the waters, frequently the freight boat is different from the hunting boat; on the land, in the Arctic region, the small freight sled is much clumsier than the traveling sled, and here we have the origin of sleds and of shipbuilding. The pack-saddle and travois for dogs were used by the hunters chiefly in conveying their game, and it would not be difficult to find in any museum a collection of hunters' devices for bringing home the fruit of their labors. Even the special craft for fishing are modified so that the hunter may not only take his game, but may freight it home.

The butcher's art of cutting up the carcass, and the smoking

[1] Payne, Edward John, *History of the New World called America*, Oxford, 1892, vol. I, pp. 311–331. Consult also B. Langkavel, *Hunde und Naturvölker* (*Internationales Archiv für Ethnographie*, Leiden, 1895, vol. VIII, pp. 109–149), with copious bibliography.

and drying of fish, mollusks, and flesh, require considerable care, labor, and ingenuity. The forming of store-houses, storage pits, and caches, in which a supply of meat is laid up for the future, was an industry practiced to a large extent in both Americas.

All the tribes of the United States and of British America were known to have dried and smoked both fish and flesh. The Nootka Indians procure the oil of the whale by placing the blubber in boxes and melting it with hot stones. The Alaskan British Columbia tribes dug circular pits both at their homes and around their fishing places, lined them with dry bark, and filled them with salmon, covering the hole with bark and earth. The Indians of Puget sound dry large quantities of clams and fish eggs. The Virginia Indians practiced the same art.

The hides of animals were not less the means of developing the inventive faculty. Leaving out the machinery for harnessing power, modern tanning involves no new processes of unhairing, fleshing, tawing, and manipulating hides. (See plate II, *g*.)

In the mechanical processes, the bones, sinews, skins, teeth, horns, hair, intestines, shells, and spines of animals supply hammers, knives, wedges, levers, saws, awls, drills, scrapers, files, clamps, thread, string, rope, thongs, vessels, boxes, and bags. The knife is the beaver tooth or shark tooth; the gimlet is the spine of the ray fish; the saw is the jawbone of some rodent; the sandpaper is the skin of the shark, the palate bone of fish, or mollusk shells; the skin scraper is the leg-bone of one of the large ruminants. So all tools for all purposes may be derived, in some way, from the bodies of animals. Von den Steinen was so impressed with the absence of stone in the Mato Grosso and the universality of animal substances for the materials and tools of industrial operations, that he suggests for culture epochs the terms Bone age and Shell age.

IV. PRODUCTS

Zoötechny concerns itself with the productions of its processes and the way in which they enter into the arts of consumption

and enjoyment. Every part of every animal that enters into savage industry is invoked to supply, as just shown, not only the needs, but the artificial wants of the savage.

Looking at a modern house, it is easy to see that it is divided into cellars or storage places, kitchens or cooking places, dining-rooms or eating places, parlors or places for social intercourse, and bedrooms or places for rest. Though these do not exist in differentiated form among savages, in every tribe of North America, however rude, there was something answering to them. The great variety of food called for an equally great variety of cooking, and so the fireplace and its surroundings, with reference to animal food, gave rise to a multitude of arts. In one place, it is roasting; in another, cooking with hot stones; in the third, in pits; in the fourth, by means of pottery, and so on through the list. The serving of food calls for eating and drinking utensils of horn, shell, hide, and bone. The Eskimo makes a dipper from the tusk of a fossil elephant; the Haida, from the horn of the Rocky Mountain sheep, the handle of which is from the horn of the goat; the buffalo horn served well the Indians of the plains; the clam shell, the eastern tribes; the turtle shell, the western tribes; the conch shell, the middle American tribes. In large areas of the western hemisphere no pottery exists, and some portions of the animal frame take the place of vessels made from that material elsewhere.

The furniture of the social room and the bedroom are made from animal integuments. The Eskimo crawls into his sleeping-bag of fur; the west-coast man wraps himself in his blanket of mountain-goat hair; the plains Indian could not live without his buffalo robe; the eastern Indian lay down in his bear skin.

In southwestern United States everywhere the babe was enfolded in a robe of rabbit skin, and even in those parts of South America where the climate requires no clothing the Indian appears decorated with beautiful cinctures of feathers and wearing hats and collars of animal teeth. Finally, at the extreme south-

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ern portion of South America the robe of a guanaco skin and the plumage of the ostrich complete the habiliment.

The house itself shares this dependence on animal materials. The Eskimo, lacking timber, supports his roof with the jawbones of whales, and in summer, in common with his Canadian neighbors, he dwells under rude skin tents. Southward, in woodless areas, the conical tipi is the house, and in Patagonia it is the toldo of guanaco skin. The textile of hair and quill, furnished by innumerable birds and by porcupines, dogs, sheep, and notably by the llama, vie with basketry, pottery, and sculpture in giving expression to the highest esthetic and mythic ideals.

V. SOCIOLOGY

The fifth inquiry concerns the relation of zoötechny to sociologic problems. Society was organized among the aborigines of America on the basis of the animals. Even among the agricultural Indians of the pueblo region this is true. Again, scarcely an industry relating to the treatment of animals was based on individual action; men were fowling, fishing, and hunting together. Much of the apparatus could not be managed by any individual, and even where such a weapon as the harpoon or bird-spear was employed, men hunted with ease in groups.

The driving and corraling of game required coöperation. Dupratz, Lawson, La Hontan, Charlevoix, Loskiel, Perrot, John Smith, Roger Williams, and Champlain all speak with enthusiasm of hunting excursions by entire villages. Von den Steinen mentions the same method of coöperation among the people of the Mato Grosso in South America, and even now in the backwoods of the United States game and fish driving for sport is practiced.

Also, in this connection must be noticed that important study of the division of labor. Men usually attended to the more difficult portions of the work, while the women made the preparations, cooked the food, manufactured the clothing, and took care of the spoils of the hunt.

Bandelier speaks of communal hunts both in New Mexico and Peru, which he characterizes as wholesale slaughter, in the most cruel manner, of all the game within the area encompassed. The meat was distributed among households and a portion was put away for a rainy day. The pueblo peoples also laid in communal stores; small tracts were cultivated for that purpose and the crops were housed in advance of the individual ones. General Dodge in *Our Wild Indians* grows excited over the annual fall hunt of the Siouan people.

In the last chapter will be shown how sociology joins with religion in fixing zoölogical conceptions on tribal life.

VI. KNOWLEDGE

In all the processes of zoötechny human intelligence has been enlarged and strengthened. The ever-increasing wariness of the animal calls for an increasing ingenuity and intelligence on the part of the hunter.

It is a fact that in every one of the eighteen environments mentioned in this paper the savage people knew the best thing for every purpose: the best substance for clothing, the best wood for the bow, for the spear, the arrow, etc.; and it is astonishing to find what a large vocabulary exists in each one of them for different forms of animal life and different parts of the animal's body. For every thought in this direction there must of course be a word or a form of speech. Therefore, language has been assisted materially in its development by the imitation of the animal, by the processes and the life of the hunter, and by all the industries associated therewith. The acquisition of knowledge through experience and the expression of this knowledge in words have been fostered largely by associations with animal life. Half the words of any primitive language are derived from man's association with beastkind.

Finally, the inventive faculty, which after all is the differentiating element between man and the brute, has been stimulated

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in the devising of property, means of capture, and tools for handling animal substances. The truth has gradually emancipated itself from the overgrowth of the imaginary, and an aboriginal empirical science of no mean proportions has been elaborated.

VII. RELIGION

Finally, in lower forms of religion and mythology, zoötheistic conceptions are prominent. Every creature is somebody. The animal world lies very near to human actions. Nearly half the totemic names gathered by Mr Hodge among the Pueblo Indians are those of animals.

The folklore and mythology of zoötechny would require a separate paper. Every tribe has its long and delightful faunal myths. Even in the pursuit of animals there are folk customs and folk beliefs that form a part of the history of religion.

The California Indians, after the acquisition of iron knives, still insisted, for superstitious reasons, on using flint and jasper flakes to cut and skin salmon, especially the first in the season. Fisher says that the wooden hunting hats of the sea-otter hunters, south of the Alaskan peninsula, are highly prized because they have the power of attracting the game, and a hunter who would part with his hat would lose his luck. Matthews in his *Mountain Chant* speaks of the old Navaho hunter taking four good sweats and lining the floor of the sudatory with the branches of sweet-smelling trees. Parkman saw an Ogalala Sioux consulting an enormous black cricket as to the position of the buffalo. Of this lore there is no end.

The Eskimo have not the gentile system, but on all their masks as well as in their carvings and etchings the overpowering influence of animal life is apparent. Among the stocks of the western coast down to Vancouver island the one obtrusive feature of the life is the totem post, the totem carving, etching, and painting, with nearly every motive from the animal kingdom. Of the Indians of the United States and Canada the following

list will convey some idea of the source of all mythological conceptions:

Tribe	*Clans or Gentes*	*Animal Totems*
Carriers (Athapascan)	4	4
Navaho[1] "	51	0
Apache[2] "	34	0
Seneka (Iroquoian)	8	8
Onondaga "	8	7
Cayuga "	8	7
Oneida "	3	3
Mohawk "	3	3
Wyandot "	8	8
Tuskarora "	8	8
Cherokee "	8	3
Mohegan (Algonquian)	11	11
Ojibwa "	23	23
Potawatomi "	15	14
Miami "	10	7
Shawnee "	13	13
Sauk "	14	10
Bloods "	5	5
Piegan "	8	1
Delaware "	34	not given.
Abnaki "	14	14
Ponka (Siouan)	8	6
Omaha "	12	7
Iowa "	8	8
Oto "	8	8
Kansa "	14	14
Winnebago "	8	7
Mandan "	7	4
Minitari "	7	2
Crow "	12	5
Creek (Muskhogean)	22	13
Choctaw "	8	1
Chickasaw "	12	8
Pawnee (Caddoan)	6	6
Shoshoni (Shoshonean)	6	6
Tlinkit (Koluschan)	10	10
Hopi (mixed stock)	87 (+)	48
Pueblo[3] (several stocks)	84	34

[1] See Matthews, *Navaho Legends* (*Memoirs Am. Folk-lore Society*, 1897, p. 31); and *Journal of American Folk-lore*, vol. III, 1890, pp. 89–110.

[2] Bourke in *Journal of American Folk-lore*, vol. III, 1890, pp. 111–126.

[3] The Pueblo stocks included are the Tanoan, Keresan, and Zuñian. See Hodge, *Pueblo Indian Clans* (*American Anthropologist*, vol. IX, 1896, pp. 345–352), and Bourke, *Snake Dance of the Moquis of Arizona*, New York, 1884.

A PAWNEE RITUAL USED WHEN CHANGING A MAN'S NAME

By ALICE C. FLETCHER

Why an Indian changes his name after any important achievement, and why he never uses the personal name when addressing another, has not yet been fully explained; therefore any first-hand information relating to this subject will undoubtedly be welcome to students of anthropology. In this connection I take pleasure in presenting a ritual used by three divisions of the Pawnee, the Chau-i′, Kit′-ka-hah-ki, and Pita-hau-i′-rat, when the ceremony of changing a man's name takes place.

A few words are fitting on two points, namely, as to how this ritual was obtained, and as to the source from which it was procured.

The difficulty of obtaining rituals used in Indian ceremonies is well known. The priests will not talk of these sacred utterances to strangers, much less recite them for record, so that in order to secure such material one must be in peculiar and confidential relations with its keepers, and be known and trusted by their people. As to the ritual to be presented, the following are the facts:

The father of Mr Francis La Flesche, my collaborator, was the former head-chief of the Omaha tribe, and during his whole lifetime was in official and intimate private relations with the chiefs, the priests, and other prominent men of the Pawnee tribe, where his memory is still green in the hearts of those who knew him. It occurred to his son to make use of his father's hold on the confidence and affection of these people in the attempt to induce some of the priests to impart a knowledge of the ancient

rites of the tribe, that they might be preserved as a part of the history of the American race.

For many years both Mr La Flesche and myself have been aware of the store of wealth hidden in the sacred ceremonies of the Pawnee, and have sought means to rescue it from impending loss. This year we were happy in being able to avail ourselves of the coöperation of Mr James R. Murie, an educated Pawnee, known to us for over sixteen years. He brought to Washington, as our guest, a venerable priest who had never before been east of the Mississippi, and was now induced to make the long journey in his old age that he might honor the memory of his early friend, the head-chief of the Omaha, by placing in the keeping of the son some knowledge of the fast-disappearing ceremonies of his tribe.

This priest was the principal keeper of a certain cult of the Pawnee, but its elaborate ceremonies and rituals formed only a part of the wealth stored in his tenacious memory. He was versed in the traditions and customs of his people, as well as in the usages of several quasi-religious societies of which he was a member. He was a man of much natural ability, mentally alert, quick to observe, and gifted with boundless patience and good nature. While he was childlike and trusting, he had a keen discernment of character, and a shrewd, common-sense way of looking at men and things. He was not indifferent to the changes that have overtaken his race, changes which have swept away the old landmarks and imposed on the people new modes of living and forced them to new ways of thinking; but these unmistakable indications of the rapidity with which aboriginal conditions are dying out failed to disconcert him, and even when they were augmented by fresh evidences, which daily confronted him at the capital, of the resources and dominant power of the white race, the convictions implanted in his mind by his religious training remained undisturbed.

When urged to take up his abode in a frame cottage on the

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reservation that he might enjoy more personal comfort than was possible in the primitive conditions in which he lived, he said: "I cannot live in a white man's house of any kind. The sacred articles committed to my care must be kept in an earth lodge, and in order that I may fulfil my duties toward them and my people, I must live there also, so that as I sit I can stretch out my hand and lay it upon mother earth."

While the vastness and the beauty of the Capitol and the Library of Congress gave him pleasure, they did not appeal to him, for such buildings, he said, were unfitted to contain the sacred symbols of the religion of his ancestors, in the service of which he had spent his long life.

He admired at a distance the Washington monument, and when we visited it he measured the base, pacing and counting his steps. Then he stood close to the white shaft and looked up, noting its great height. We went inside, and when asked which he would take, the elevator or the stairs, he replied: "I will not go up. The white man likes to pile up stones, and he may go to the top of them; I will not. I have ascended the mountains made by Ti-ra'-wa."

Equally characteristic was his interview with the Commissioner of Indian Affairs. When introduced, he said: "I am glad to see you and to take you by the hand. Many chiefs of my tribe have done so; I never expected to do it. I have nothing to ask of you; nothing to tell you. I came here to talk of the religion of my fathers which I follow. You can ask my sister [referring to me] what I have said."

The weeks spent with this old man will ever be memorable. He illustrated the persistency of belief, and the dignity of unwavering trust in the power and care of the gods of his fathers. Of the genuineness of his statements there can be no doubt. He had not in the least been thrown off his mental balance by the insistence of his new and strange surroundings. While he had been forced to conform to some of our modes of living, the

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atmosphere of his mind was seemingly unaffected by the culture of our race. His unquestioning faith in the religion of his forefathers soared far above the turbulent conditions of today, and gave to him a calm akin to the serenity of childhood, which was reflected in his kindly, smiling, and peaceful face. His name was Ta-hi'-roos-sa-wi-chi, and he belonged to the Chau-i' division of the Pawnee.

The priest, having first engaged in silent prayer, intoned the ritual, of which a graphophone record was taken.

The words were separated into syllables. Sometimes an entire word or parts of two words were represented by a single syllable, and each syllable in the ritual was uttered as though it was a complete word. Rather a high pitch was taken for the recital, probably from habit, as the ritual was always given in the hearing of a great multitude.

Mr Murie and I spent three days in the translation and study of the ritual, assisted by the priest, who explained to us many points that were somewhat obscure, owing to elisions, the employment of a single word as a mnemonic to call up the picture of a complicated action, and the forcing of words to a different application from that of ordinary speech—a not uncommon occurrence in rituals. He carefully watched our work step by step, lest we should fall into mistakes, remarking that the ritual "speaks of the powerful gods of whom man should be careful what he says." The translation represents much painstaking labor on the part of Mr Murie, whose intelligent interest in the history of his tribe is worthy of record, and bids fair to bear fruit in the near future.

There is one aspect of the ritual, essential to its understanding, that was very carefully studied by us, and I will give the gist of many conversations on the subject. The priest explained that a man's life is an onward movement. If one has within him a determined purpose and seeks the favor of the gods, his life will "climb up." Here the priest made a gesture indicating a line

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slanting upward; then he arrested the movement, and, still holding his hand where he had stopped, went on to say that, as a man is climbing up, he does something that marks a place in his life where the gods have given him the opportunity to express in acts his peculiar powers, so this place, this act, forms a stage in his career, and he takes a new name to indicate that he is on a level different from that which he occupied previously. Some men, he said, can rise only a little way, others live on a dead level, and he illustrated his words by moving his hands horizontally. Men having power to advance, climb step by step, and here again he made his idea plain to us by a gesture picturing a slant, then a level, a slant, and a level. In this connection he called our attention to the words, in the first movement of the ritual, *ru-tu'-rah-witz pa'-ri*, "to overtake walking," saying that the people who desire to have a name, or to change their name, must strive to overtake in the walk of life an upper level, such a one as these ancient men spoken of in the ritual had reached, and where they threw away the names by which they had been known before. "*Ru-tu'-rah-witz pa'-ri*" is a call to the Pawnee bidding them emulate these men and overtake them by the doing of like deeds.

Without entering into a dissertation concerning the meaning of Indian names, or into a detailed description of the Pawnee ceremonial of bestowing them, which could be performed by itself, or as a sort of episode in some other ceremony, three facts connected with the Pawnee custom of taking a name should be stated:

First—A man was permitted to take a name only after the performance of an act indicative of great ability or strength of character, such as prowess, generosity, prudence, courage, or the like.

Second—The name had to be assumed openly, before the people to whom the act it commemorated was known.

Third—It was necessary that it should be announced by a priest in connection with such a ritual as we are about to consider.

These three facts indicate (1) that a man's name stood for what he had shown himself to be in the light of his action; (2) this was recognized by his tribesmen; and (3) it was proclaimed by one having in charge the mediatory rites through which man could be approached by the supernatural. With these three facts in mind we will examine the ritual.

Three dramatic movements are expressed in it, but they cannot be treated separately as they are closely interdependent.

The first movement gives a brief narration of the institution of the custom of changing the name in consequence of some new achievement.

The second shows how the man was enabled to accomplish this act. It begins with his lonely vigil and fast, when he cried to the gods for help. The scene then shifts to the circle of the gods, who in council deliberate on the petition which makes its way to them and gains their consent. Then the Winds summon the messengers, and these, gathering at the gods' command, are sent to earth, to the man crying in lonely places, to grant his desire. The movement closes with a few vivid words which tersely set forth that only by the favor and help of the gods had the man been able to do the deed.

The third deals with the man's names—the one to be discarded and the one now to be assumed.[1]

THE RITUAL

1 Hi-ri! Wȧ-ku'-ra-ru-ta sha-ru wi-ti ra-ra-wa-a ki-ru sha-ru re-ru kit-a-wi Rah-wi-rah-ri-so ti-ra kah-ho ri-wi-ri.

2 Hi-ri! Rȧ-ru kit-a-wi Rah-wi-rah-ri-so ra-hoo ti shi-ra ru-tu-rah-witz pa-ri u-sa-ru i re.

3 Hi-ri! Ra-ru kit-a-wi Rah-wi-rah-ri-so ra-hoo ti shi-re-ra kit-a-wa u-sa-ru.

4 Hi-ri! Ri-ru-tzi-ra-ru; ra-sa roox-sa pa-ka-ra-ra witz pa-ri, Hi-ri! ti-ru-ta, Hi-ri! ti-ra-koose ta-ra-ra-wa-hut, ti-ri.

[1] The termination of one movement and the beginning of another are indicated to the eye by extra spacing between the third and fourth, and the eleventh and twelfth lines.

5 Hi-ri! Ri-ru-tzi-ra-ru; ra-sa roox-sa pa-ka-ra-ra witz pa-ri, Hi-ri! ti-ru-ta; Hi-ri! Ti-ra-wa, Ha! ti-ri.

6 Hi-ri! Ri-ru-tzi-ra-ru; si-ra wa-ku ri-ka-ta i-wa-hut, Hi-ri! ti-ru-ta, Hi-ri! ti-ra-koose ti-ra-ra-wa-hut, ti-ri.

7 Hi-ri! Ri-ru-tzi-ra-ru; si-ra wa-ku ra-ri-sut, Hi-ri! ti-ru-ta, Hi-ri! Ti-ra-wa, Ha! ti-ri.

8 Hi-ri! Ri-ru-tzi-ra-ru; Ra-ra-ri-tu, ka-ta wi-tix-sut-ta.
Ra-ki-ris ta-ka-ta wi-tix-sut-ta.
Ra-ki-ris ta-ru-koox-pa, ra-ru-tu-ra tu-ka-wi-ut ta-ri.

9 Hi-ri! Ri-ru-tzi-ra-ru; ru-ri Pa-pa-pi-chus ta-ka wi-tix-sut-ta.
Ru-ri Pa-pa-pi-chus ta-ru-koox-pa ra-ru-tu-ra tu-ka-wi-ut ta-ri.

10 Hi-ri! Ri-ru-tzi-ra-ru; ru-chix ku-so-ho ri-ra-ka-ta koox-sa-ta, Ka-ha-ri-wi-si-ri, ku ka-tit ti-ki; Ka-ha-ri-wi-si-ri, ku pa-ha-ti ti-ki; Ka-ha-ri-wi-si-ri, ku ra-ka-ta ti-ki; Ka-ha-ri-wi-si-ri, ku ta-ka ti-ki.

11 Hi-ri! Ri-ru-tzi-ra-ru; si-ra su-ra wa-u-rux pa-ra, ra-ru-tu-ra tu-ka-wi-ut ta-ri.

12 Ra-wa! Ha-wa u-ra-sha-ru we tat-ki-wa-ti.

13 Hi-ri! Ta-tux ta-pa-ki-a-ho, ha-wa, Ra-ruts-ka-tit! Hi-ri! Ra-ro rik-cha ro re.

14 Hi-ri! Wȧ-ko-ru ra-to-ra pa-ke-oos-to.

15 Hi-ri! A-ki-ta-ro hi-wȧ we-ra-ta-we-ko.

16 Hi-ri! Sha-ku'-ru Wa'-ruk-ste. Hi-ri-wa wi-ti ra-ka-wȧ-ka-ru ko re.

The following verbal translation is by Mr Murie, in which no attempt has been made to treat the ritual from a linguistic point of view, or to enter into the peculiar use and composition of the words.

VERBAL TRANSLATION [1]

1 *Hi-ri*—an exclamation; Harken! Give heed!
wȧ-ku'-ra-ru-ta—it came to pass a long time ago.
sha'-ru—from *u'-ra-sha'-ru*, name.
wi-ti—they.
ra-ra-wa-a—discarded, had done with, threw away.
ki'-ru—ancient.
sha'-ru—from *koos-sha-ru*, a certain place known only by tradition.
re'-ru—it was, or it came about.

[1] The vowels have the continental sound. *h* at the end of a syllable means that the breath must be heard. A dot over a vowel flattens the sound. The *r* has a slight trill.

kit'-a-wi—from *ki*, through, and *ta'-wi*, them.

Rah-wi'-rah-ri-so—a Leader, one entitled to carry the sacred corn by virtue of having passed through certain rites.

ti'-ra—they.

kah-ho—a wide expanse; *kah* conveys the picture that this expanse is spanned as by a roof; *ho* suggests an enclosed space, as a dwelling; *kah-ho* calls up the idea that the earth is a vast abode roofed by the heavens, where dwell the gods.

ri'-wi-ri—walking, spoken of persons not present. *Ra-ra'-wa-ri* is to travel (walking) like warriors, and the word in the text refers to such walking, to the *Rah-wi'-rah-ri-so* and the men under his leadership walking the wide earth beneath the arching sky.

2 *Hi-ri*—harken.

ra'-ru—a company or a number of persons.

kit'-a-wi—through them.

Rah-wi'-rah-ri-so—the Leader.

ra'-hoo—a class of songs that could be composed and sung only by a successful leader; a Victory song.

ti—from *ti'-ra*, they.

shi-ra—from *shi-re'-ra*, brought; the *re* eliminated for euphony.

ru-tu'-rah-witz—overtake.

pa-ri—walking; singular, present tense.

u-sa'-ru—a place where something occurred known only by a tradition preserved in song.

i re—singing vocables.

3 *Hi-ri*—harken.

ra'-ru—a number of persons. The word here refers both to the Leader and his men, and to the people of their village.

kit'-a-wi—through them. Another double reference like the former.

Rah-wi'-rah-ri-so—the Leader.

ra'-hoo—the Victory song.

ti—they.

shi-re'-ra—brought.

kit'-a-wa—from *kit*, top; *ta*, coming; *wa*, from *wa'-ku*, hill; this composite word conveys the picture of the returning men bringing their Victory song and singing it as they reach the top of the hill near their village.

u-sa'-ru—the word here means that the Victory song commemorated the event, after which the Leader instituted the custom of changing the name.

(*These three lines constitute the first movement of the ritual*)

4 *Hi-ri*—harken.
ri-ru'-tzi-ra-ru—by reason of, by means of, because of. This word has a wide significance and controlling force in the ritual.
ra'-sa—the man stood.
roox-sa—he said or did.
pa-ka-ra'-ra—a loud call, sending the voice to a great distance.
witz—from *ta-witz'-sa*, to reach or arrive.
pa-ri—traveling. These five words stand for a religious rite performed by the man, or Leader. The first two tell that he went alone to solitary places to fast and pray, seeking to secure the favor of the gods; the last three describe how his voice, bearing his petition, traveled on and on, striving to reach the gods' abode.
Hi-ri—a call for reverent attention.
ti'-ru-ta—special or assigned places, referring to the abodes or places where the lesser gods dwell, assigned there by *Ti-ra'-wa*, the highest power, the one over all.
Hi-ri—reverent attention demanded.
ti'-ra-koose—sitting; present tense, plural.
ta-ra-ra-wa'-hut—a term for sky, or heavens; it implies a circle, a great distance, and the dwelling place of those beings which, for the lack of a better name, we call gods.
ti-ri—above, up there, as if the locality were designated by pointing upward.

5 *Hi-ri*—harken.
ri-ru'-tzi-ra-ru—because.
ra'-sa—the man stood.
roox-sa—did.
pa-ka-ra'-ra—send voice to a distance
witz—reached.
pa-ri—traveling.
Hi-ri—call for reverent attention.
ti'-ru-ta—abodes of the lesser gods.
Hi-ri—reverent attention.
Ti-ra'-wa—the supreme god.
Ha—an exclamation of awe.
ti-ri—above all.

6 *Hi-ri*—harken.
ri-ru'-tzi-ra-ru—by reason of.
si'-ra—they took.
wa'-ku—they said.
ri'-ka-ta—received.

i-wa'-hut—from *i-wa*, to hand over or pass on to the one next; and *ta-ra-we-hut*, the circle above in the heavens; the word means handed or passed around the circle.

Hi-ri—reverent exclamation.

ti'-ru-ta—abodes of the gods.

Hi-ri—reverent attention asked for.

ti'-ra-koose—sitting.

ti-ra-ra-wa'-hut—circle in the heavens.

ti-ri—up above.

7 *Hi-ri*—harken.

ri-ru'-tzi-ra-ru—because of.

si'-ra—they took.

wa'-ku—they said.

ra-ri'-sut—gave consent; granted.

Hi-ri—call for reverent attention.

ti'-ru-ta—abodes of the lesser gods.

Hi-ri—reverent attention.

Ti-ra'-wa—the supreme god.

Ha—exclamation of awe.

ti-ri—above all.

8 *Hi-ri*—harken.

ri-ru'-tzi-ra-ru—by means of.

Ra-ra-ri'-tu—an old term for Winds; it also means heavy storm-clouds. *Ra-ri'-tu*, a cyclone. The word in the text has a double significance; it stands for Winds, and for the summoning by the Winds of the storm-clouds.

ka'-ta—rising up, climbing up.

wi'-tix-sut-ta—reached there.

Ra-ki'-ris—plural form, Thunders.

ta-ka'-ta—ascending, advancing upward.

wi'-tix-sut-ta—reached a given place.

Ra-ki'-ris—Thunders.

ta-ru-koox'-pa—an action concluded.

ra-ru'-tu-ra—from *ra-ru*, at that; and *tu-ra*, ground; the word means that at the conclusion of the action (here understood) they descended to the earth.

tu-ka'-wi-ut—slantwise.

ta-ri—the end of a mission or of an action.

9 *Hi-ri*—harken.

ri-ru'-tzi-ra-ru—by means of, or by the agency of.

ru-ri—at that time.

Pa-pa-pi'-chus—Lightning; *pa-pa*, zigzag; *pi'-chus*, darting, flashing.

ta-ka—within, enclosed.
wi'-tix-sut-ta—reached there.
ru-ri—at that time.
Pa-pa-pi'-chus—Lightning.
ta-ru-koox'-pa—an action concluded.
ra-ru'-tu-ra—and then, they descended to earth.
tu-ka'-wi-ut—slantwise.
ta-ri—the end of their mission.

10 *Hi-ri*—harken.
ri-ru'-tzi-ra-ru—by means of.
ru-chix—they did.
ku-so'-ho—flock.
ri-ra-ka'-ta—in front of.
koox'-sa-ta—from side to side, as when ranging a path.
Ka-ha'-ri-wi-si-ri—Swallows.
ku—breast.
ka-tit—black.
ti-ki—they were.
Ka-ha'-ri-wi-si-ri—Swallows.
ku—breast.
pa-ha'-ti—red.
ti-ki—they were.
Ka-ha'-ri-wi-si-ri—Swallows.
ku—breast.
ra-ka'-ta—yellow.
ti-ki—they were.
Ka-ha'-ri-wi-si-ri—Swallows.
ku—breast.
ta'-ka—white.
ti-ki—they were.

11 *Hi-ri*—harken.
ri-ru'-tzi-ra-ru—because.
si'-ra—they took, refers to the Leader and to the men who followed and depended on him.
su-ra—possess, to become one's own.
wa-u-rux'—grasped, as a staff.
pa'-ra—walked.
ra-ru'-tu-ra—refers to that which descended to earth.
tu-ka'-wi-ut—slantwise.
ta-ri—end, or accomplished mission.

(*The second movement of the ritual here comes to an end*)

12 *Ra'-wa*—A call for attention, at the moment.
ha'-wa—once more.
u-ra-sha-ru—name.
we—I.
tat-ki'-wa-ti—change.

13 *Hi-ri*—harken.
ta-tux—we used to.
ta-pa-ki-a-ho—speak of him.
ha'-wa—once more.
Ra-ruts-ka'-tit—the former name, meaning black-feathered arrow.
Hi-ri—harken.
ra-ro—owner.
rik-cha—lying. These words refer to the achievement commemorated by the name about to be thrown away.
ro re—vocables.

14 *Hi-ri*—harken.
wȧ-ko-ru—now we are.
ra-to-ra—all people.
pa-ke'-oos-to—speak out and say.

15 *Hi-ri*—harken.
a-ki-ta-ro—tribe.
hi-wȧ—in the.
we-ra-ta-we-ko—prominent.

16 *Hi-ri*—harken.
Sha-ku'-ru Wa'-ruk-ste—the new name now announced ("Sacred Sun").
hi-ri-wa—in the process of making.
wi-ti—himself.
ra-ka-wȧ'-ka-ru—what he is.
ko re—vocables.

This dramatic poem is in a rhythmic form impossible to reproduce in English. Our language does not permit of the treatment which the Pawnee tongue receives in the ritual; there, words are cut apart, combined, or represented by a single syllable in order that the rhythmic flow may be uninterrupted.[1] Neither is a literal

[1] Mr John B. Dunbar, an authority on the Pawnee language, writes: "It [the language] may rightfully challenge eminent position for its beauty as well as for its detailed flexibility. Even in its daily use careful attention is given to the euphonic element, in the employment of euphonic syllables, in the omission of syllables or letters, and in the substitution of letters; while its system of verbal inflection frequently admits of the compendious expression of shades of meaning which has usually quite

translation adequate to convey the meaning of the ritual. A single word sometimes represents a complex action, to the understanding of which a knowledge of the customs and the beliefs of the tribe is essential. The terseness of expression was also intended to close the meaning to the uninitiated, keeping it as sacred from the common people. Take, for example, the fourth stanza, which in Pawnee contains thirty-five syllables representing thirteen words. Literally translated these would read: "Harken by reason of the man stood said and did loud call to reach traveling Harken special places Harken sitting circle above." These words were explained and amplified by the priest exactly as is given in the close translation of the same stanza. By the light of this amplification the words of the ritual, otherwise unintelligible, become full of meaning to anyone familiar with the customs and thought of the tribe. The same is true of every other stanza given in the following close translation. I have deemed it proper to throw this translation into rhythmic form that something like its native cadence may be preserved. My aim has been to present the ritual, inadequately it is true, as it appealed to the thoughtful and reverent Pawnee.

CLOSE TRANSLATION

1 Harken! 'Twas thus it came to pass:
In ancient days, a Leader and his men
Walked this wide earth, man's vast abode
Roofed by the heavens, where dwell the gods.
They reached a place, the spot no man can tell,
Faced dangers dread, and vanquished them;
Then, standing as if born anew to life,
Each warrior threw away the name
That had been his ere yet these deeds were done.

2 Harken! The Leader and his men
Made there the Vict'ry song, and set the mark
Ye must o'ertake, if ye would be like them!

disappeared from the languages of literature." A "special excellence"—in certain compositions—"with the Pawnee seems often to consist in its intense brevity."—Grinnell, *Pawnee Hero Stories and Folk-Tales*, app., pp. 409, 435.

3 Harken! The Leader and his men
Turned then toward home. Their Vict'ry song
Proclaimed them near; the village rose,
Looked toward the hill, where on the top
Stood the brave men, singing their song,
Heralding thus the favor of the gods
By which they had surpassed all former deeds,—
Made new their claim to be accounted men.

4 Harken! And whence, think ye, was borne
Unto these men, courage to dare,
Strength to endure hardship and war?
Mark well my words, as I reveal
How the gods help man's feebleness.
The Leader of these warriors was a man
Given to prayer. Oft he went forth
Seeking a place no one could find.
There would he stand and lift his voice
Fraught with desire, that he might be
Invincible, a bulwark 'gainst all foes
Threat'ning his tribe, causing them fear.
Night-time and day this cry sped on,
Traveling far, seeking to reach—
Harken! Those places far above,
Harken! Within the circle vast
Where sit the gods, watching o'er men.

5 Harken! This poor man's prayer went on,
Speeding afar into the blue
Heavens above, reached there the place—
Harken! Where dwell the lesser gods,
Harken! And great Ti-ra'-wa, mightier than all!

6 Harken! It was because a god
Received this prayer, considered it,
Favored its plea, and passed it on
To him whose place was next, in that grand ring,
Who, in his turn received the prayer,
Considered it, and sent it on—
Harken! Around that circle vast,
Harken! Where sit the gods above.

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7 Harken! And thus it was the prayer
Sent by this man, won the consent
Of all the gods. For each god in his place
Speaks out his thought, grants or rejects
Man's suppliant cry, asking for help;
But none can act until the Council grand
Comes to accord, thinks as one mind,
Has but one will, all must obey.
Harken! The Council gave consent;
Harken! And great Ti-ra'-wa, mightier than all!

8 Harken! To make their purpose known,
Succor and aid freely to give,
Heralds were called, called by the Winds.
Then in the west uprose the Clouds
Heavy and black, ladened with storm.
Slowly they climbed, dark'ning the skies;
While close on every side the Thunders marched
On their dread way, till all were come
To where the gods in stately council sat
Waiting for them. Then, bade them go
Back to the earth, carrying aid
To him whose prayer had reached their circle vast.
This mandate given, the Thunders turned toward earth,
Taking their course slantwise the sky.

9 Harken! Another followed hard—
Lightning broke forth out of the cloud,
Zigzag and dart, cleaving their way
Slantwise to earth, their goal to reach.

10 Harken! For these two were not all
That hastened to proclaim the gods' behest—
Swift on their wings, Swallows in flocks
Swept in advance, ranging the path,
Black breasts and Red, Yellow, and White,
Flying about, clearing the way
For those who bore the message of the gods
Granting the man courage to dare,
Strength to endure, power to stand
Invincible, a bulwark 'gainst all foes.

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11 Harken! 'T was thus it came to pass:
The Leader grasped the help sent by the gods;
Henceforth he walked steadfast and strong,
Leading his men through dangers drear,
Knowing that naught could strike at him
To whom the gods had promised victory.

12 Attend! Once more I change his name.

13 Harken! *Ri-ruts'-ka-tit* it was
We used to call him by, a name he won
Long days ago, marking an act
Well done by him, but now passed by.

14 Harken! Today all men shall say—

15 Harken! His act has lifted him
Where all his tribe behold a man

16 Clothed with new fame, strong in new strength,
Gained by his deeds, blessed of the gods.
Harken! *Sha-ku'-ru Wa'-ruk-ste* shall he be called.

From the teaching of this ritual it appears—

First—That a man's name marked an epoch in his life, the accomplishment of something in which both gods and men had borne a part, and that as his life progressed and new achievements were gained, a memorial was established by his taking a new name.

Second—That so personal and sacred a meaning was attached to a name as to render it unfit for the familiar purposes of ordinary address, to a people as reverently inclined as the Indians seem to have been.

SOME RECENT CRITICISMS OF PHYSICAL ANTHROPOLOGY

By FRANZ BOAS

During recent years a number of severe attacks against the methods of physical anthropology have been made, which are directed mainly against two points—(1) the possibility of classifying mankind according to anatomical characteristics, and (2) the practicability of description of types by means of measurements.

Before we attempt to reply to these criticisms, it may be well to make a few brief remarks on the development of the methods of physical anthropology. The living representatives of the various races of man were originally described according to their general appearance,—the color of the skin, the form and color of the hair, the form of the face, etc. Later this general description was supplemented by the study of the skeletons of various races, and a number of apparently characteristic differences were noted. One of the principal reasons that led to a more detailed study of the skeleton and to a tendency to lay the greatest stress upon characteristics of the skeleton, was the ease with which material of this kind could be obtained. Visitors to distant countries are likely to bring home skeletons and parts of skeletons, while not much opportunity is given for a thorough examination of a considerable number of individuals of foreign races. The difficulty of obtaining material relating to the anatomy of the soft parts of the body has had the effect that this portion of the description of the anatomy of man has received very slight attention. In comparatively few cases have we had opportunity to make a thorough study of the characteristics of the soft parts of the body of individuals belonging to foreign races. The desire to find

good specific characters in the skeleton has also been stimulated by the necessity of studying extinct races. The conditions in these cases are the same as those found in paleontological studies, where the osseous remains alone of extinct species are available. Researches into the earliest history of man must be based on studies of the skeleton.

Studies of the human skeleton had not been carried very far when it was found to be not quite easy to determine racial characteristics with sufficient accuracy by mere verbal description. This led to the introduction of measurements as a substitute for verbal description. With the increase of the material, the necessity of accurate description became more and more apparent, because intermediate links between existing forms were found with increasing frequency. These conditions have led to a most extensive application of the metric method in the study of the human skeleton and also in the study of the external form of the living.

The results of the minute studies that have been carried on in this manner appear discouraging to many students, because we have not been able to find any criterion by which an individual skeleton of any one race can be distinguisheed with certainty from a skeleton belonging to another race, except in a very general way. A typical full-blood negro may be distinguished from a white man, and an Indian of Florida from an Eskimo; but it would be difficult to distinguish the skeleton of a Chinaman from that of certain North American Indians.

This lack of definite individual descriptive features has led many investigators to conclude that the method is at fault, and that the skeleton cannot be used as a satisfactory basis for a classification of mankind. This view has been strengthened by the belief, frequently expressed, that the characteristic features of each race are not stable, but that they are influenced to a great extent by environment, geographical as well as social.

It seems to me that these views are not borne out by the

observations that are available. The first objection, which is based on the lack of typical characteristics in the individual, does not take into consideration the fact that anthropological study is not a study of individuals, but of local or social varieties. While it may be impossible to classify any one individual satisfactorily, any local group existing at a certain given period can clearly be characterized by the distribution of forms occurring in that group. I do not hesitate to say that, provided we had satisfactory statistics of the distribution of human forms over the whole globe, an exhaustive description of the physical characteristics of any group of individuals belonging to one locality would enable us to identify the same without any difficulty. This clearly emphasizes the fact that anthropological classification must be considered as a statistical study of local or social varieties. But it will be asked, How does this help in classifying individual forms? The problem must be considered in the following way:

Each social unit consists of a series of individuals whose bodily form depends on their ancestry and on their environment. If the opinion of the critics of physical anthropology regarding the predominant effect of environment is correct, then we cannot hope to make any discoveries as to ancestry of local or social groups by means of anatomical investigations. If, on the other hand, it can be shown that heredity is the predominant factor, then the prospects of important discoveries bearing on the early history of mankind are very bright indeed. It seems to the writer that a biological consideration makes it very probable that the influence of heredity should prevail, and thus far he has failed to find conclusive proof to the contrary.

The critics of the method of physical anthropology will of course concede that a negro child must be a negro, and that an Indian child must be an Indian. Their criticism is directed against the permanence of types within the race; for instance, against the permanence of short or tall statures, or against the permanence of forms of the head. It must be conceded that

muscular development may exert an important influence on the forms of bones, but it does not seem likely that it can bring about an entire change of form. The insufficiency of the influence of environment appears in cases where populations of quite distinct types inhabit the same area and live under identical conditions. Such is the case on the North Pacific coast of our continent; such was the case in successive populations of southern California and of Utah.

While this may be considered good evidence in favor of the theory of predominance of the effect of heredity, the actual proof must be looked for in comparisons between parent and offspring. If it can be shown that there is a strong tendency on the part of the offspring to resemble the parent, we must assume that the effect of heredity is stronger than that of environment. The method of this investigation has been developed by Francis Galton and Karl Pearson, who have given us the means of measuring the degree of similarity between parent and child. Wherever this method has been applied, it has been shown that the effect of heredity is the strongest factor in determining the form of the descendant. It is true that thus far this method has not been applied for series of generations, and under conditions in which a considerable change of environment has taken place, and we look forward to a definite solution of the problem of the effect of heredity and of environment through the application of this method. In the study of past generations we cannot, on the whole, compare directly parent and offspring, but we have to confine ourselves to a comparison between the occurrence of types during successive periods. The best available evidence on this subject is found in the populations of Europe. It does not seem likely that the present distribution of types in Europe can be explained in any other way than by the assumption that heredity had a predominant influence. Much has been made of the apparent change of type that takes place in the cities of Europe in order to show that natural selection may have played

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an important part in making certain types of man predominant in one region or another. Ammon has shown that the city population of southwestern Germany is more short-headed than the country population, and concludes that this is due to natural selection. All the phenomena of this character that have been described can be explained satisfactorily by the assumption that the city population is more mixed than the country population. This point has been brought out most clearly by Livi's investigations in Italy, where he has proved that in regions where long-headed forms prevail in the country, in the city the population is more short-headed; while in regions in the country in which short-headed forms prevail, in the city the population is more long-headed.

It seems to me that, under present conditions, it is best in the study of the anatomical characteristics of man not to start from far-reaching assumptions in regard to the question of the effect of heredity and environment, but first of all to ascertain the distribution of types of man. This is a definite problem that requires treatment and investigation just as much as the study of languages or the study of the customs of various tribes. At the present time we are far from being familiar with the distribution of types on the various continents. No matter what the ultimate explanation of the distribution of types may be, we cannot evade the task of investigating their present distribution and of seeking for the explanation of the reasons for such distribution.

Before entering into this subject more fully, it may be well to take up the second criticism of the method of physical anthropology, which has been made with increasing frequency of late years. A number of investigators object to the metric method of anthropology, and desire to bring about a substitution of description for measurements. This proposition is based on a misunderstanding of the function of measurements. The necessity of making measurements developed when it was found that the local varieties of mankind were very much alike—so much so that

a verbal description failed to make their characteristics sufficiently clear. The process by means of which measurements have been selected has been a purely empirical one. It has been found that certain measurements differ considerably in various races, and are for this reason good racial criteria. The function of measurements is therefore solely that of giving greater accuracy to the vague verbal description. It is true that in the course of time a tendency has developed of considering as the sole available criteria of race, the measurements which by experience have been found to be useful. This is true particularly of the so-called cephalic index; that is, the proportion of width to length of head. There are anthropologists who have subordinated everything else to the study of the cephalic index, leaving out of consideration altogether the forms of the skull and of the skeleton as expressed by their metric relation or as expressed by means of drawings or diagrams. It has frequently been pointed out that the same cephalic index may belong to forms that anatomically cannot be considered as equivalent. We find, for instance, that the same cephalic index belongs to the Eskimo, to the prehistoric inhabitant of southern California, and to the negro. Still these three types must be considered as fundamentally different. Anthropologists who limit their work to the mechanical application of measurements, particularly of single measurements, and who try to trace the relationships of races by such means, do not apply the metric method in a correct way. It must be borne in mind that measurements serve the purpose only of sharper definition of certain peculiarities, and that a selection of measurements must be adapted to the purpose in view. I believe the tendency of developing a cast-iron system of measurements, to be applied to all problems of physical anthropology, is a movement in the wrong direction. Measurements must be selected in accordance with the problem that we are trying to investigate. The proportion of length and breadth of head may be a very desirable measurement in one case, while in another case it may be of no value

whatever. Measurements should always have a biological significance. As soon as they lose this significance they lose also their descriptive value.

The great value of the measurement lies in the fact that it gives us the means of a comprehensive description of the varieties contained in a geographic or social group. A table that informs us of the frequency of various forms as expressed by measurements that occur in a group, gives us a comprehensive view of the variability of the group that we are studying. We can then investigate the distribution of forms according to statistical methods; we can determine the prevalent type and the character of its variation. The application of rigid statistical methods gives us an excellent means of determining the homogeneity and the permanence of the type that is being studied. If a group of individuals who present a homogeneous type is not subject to changes, we must expect to find the types arranged according to the law of probabilities; that is to say, the average type will be the most frequent one, and positive and negative variations will be of equal frequency. If, on the other hand, the homogeneous type is undergoing changes, the symmetry of arrangement will be disturbed, and if the type is dishomogeneous we must expect irregularities in the whole distribution. Investigations of this character require the measurement of very extensive series of individuals in order to establish the results in a satisfactory manner. But the character of the distributions that may thus be obtained will furnish material for deciding a number of the most fundamental questions of physical anthropology.

I may now revert to the question previously under discussion. I have tried to show that the metric method may furnish us material proving the homogeneity or dishomogeneity of groups of certain individuals. This test has been applied to a number of cases. I have examined from this point of view the North American half-bloods, that is, individuals of mixed Indian and white descent. I have shown that the transverse development of the

face, which is the most distinctive difference between Indian and white, shows a tendency in the mixed race to revert to either of the parental races, and that there is no tendency toward the development of an intermediate form. Bertillon has shown similar irregularities to exist in France. On the other hand, extensive series of measurements of enlisted soldiers of Italy show in many parts of the kingdom a comparatively homogeneous series. Hand in hand with this phenomenon go remarkable differences of variability. In places where we have reason to believe that distinct types have intermingled, we find a great increase in variability, while in regions occupied by homogeneous populations the variability seems to decrease. These facts are very strong arguments for the assumption of a great permanence of human types. It is necessary that the analysis of distributions of measurements be carried much farther than it has proceeded up to the present time; this done, and I believe we shall obtain a means of determining with considerable accuracy the blood relationships of the geographical varieties of man.

I wish to say a word here in regard to the question of the relationship between the earliest prehistoric races and the present races. Insofar as the reconstruction of the characteristics of prehistoric races can be based on extensive material, there will be a certain justification for a reconstruction of the soft parts, if a detailed comparison of the osteological remains of prehistoric types and of present types proves them to be conformable. Where, however, the similarity is based on a few isolated specimens, no such reconstruction is admissible, because the attempt presupposes the identity of the prehistoric race with the present. Since remains of the earliest man are very few in number, it is hardly possible to gain an adequate idea of what the characteristics of the soft parts of his body may have been.

When we base our conclusions on the considerations presented in this paper, we must believe that the problem of physical anthropology is as definite as that of other branches of anthropol-

ogy. It is the determination and explanation of the occurrence of different types of man in different countries. The fact that individuals cannot be classified as belonging to a certain type shows that physical anthropology cannot possibly lead to a classification of mankind as detailed as does the classification based on language. The statistical study of types will, however, lead to an understanding of the blood relationship between different types. It will consequently be a means of reconstructing the history of the mixture of human types. It is probable that it will lead also to the establishment of a number of good types which have remained permanent through long periods. It will be seen that that part of human history which manifests itself in the phenomena that are the subject of physical anthropology is by no means identical with that part of history which manifests itself in the phenomena of ethnology and of language. Therefore we must not expect that classifications obtained by means of these three methods will be in any way identical. Neither is it a proof of the incorrectness of the physical method if the limits of its types overlap the limits of linguistic groups. The three branches of anthropology must proceed each according to its own method; but all equally contribute to the solution of the problem of the early history of mankind.

PRELIMINARY REVISION OF THE EVIDENCE RELATING TO AURIFEROUS GRAVEL MAN IN CALIFORNIA

By WILLIAM H. HOLMES

FIRST PAPER

INTRODUCTORY

During recent years much has been said and written regarding the antiquity of man in America, and as opportunity has presented I have engaged in the discussion of the subject, endeavoring to determine the exact value of the evidence brought forward by the various observers. By far the strongest body of data tending to establish the existence of a man of great antiquity is that emanating from the gold belt of California, and first brought together by Prof. James D. Whitney and published in his notable work on the Auriferous gravels.[1] There is considerable literature embodying original observations outside of this volume, the most important contribution being a paper by Dr George F. Becker, published in the *Bulletin* of the Geological Society of America for 1891.

For a long time I have entertained the idea of visiting the Pacific slope for the purpose of becoming personally acquainted with the region furnishing the evidence, and with the people, so far as the hand of time has spared them, familiar with the golden era of California. I hoped at least to see enough to enable me to make up my own mind as to the value of the evidence, and it seemed within the range of possibility that something decisive in the way of new evidence, or of side lights on the old, might de-

[1] J. D. Whitney, *The Auriferous Gravels of the Sierra Nevada of California*, Cambridge, 1879, vol. VI, No. 1 (1st part).

velop—something that would open the way to a final settlement of the great questions at issue.

In September, 1898, I received instructions from the Secretary of the Smithsonian Institution to visit California for the purpose of making collections and of prosecuting anthropological investigations along such lines as might promise to be of value to the National Museum. It was arranged that the work should be conducted under the auspices of the Director of the Bureau of American Ethnology. A short time before setting out I learned that Prof. W J McGee was contemplating a trip to the southwest a little later in the season, and I succeeded in inducing him to join me for a short time in the Auriferous gravel region; I thus had the advantage of conjoint work with him in a section of superlative interest geologically, archeologically, and scenically, and one that has been made classic in science by Whitney and in song by Bret Harte.

HISTORY OF DISCOVERIES

The auriferous, or gold-bearing, gravels, with which we are especially concerned, are scattered over a vast area in central California, extending from the high sierra on the east down the far-reaching ridges and canyons to the lowlands of the coastal belt, and from the Yuba on the north to the Merced on the south, an area equal in extent, perhaps, to that of the state of Connecticut.

The great gold discoveries began with the influx of miners in 1849, and during the two or three succeeding decades the gravel deposits were dug over to an extent without parallel in the history of mining operations. They were first attacked by pick and pan, then sluicing was introduced, and later hydraulic operations were conducted on a grand scale. Tunnel mining was also extensively carried on, and the mountains were pierced by countless shafts, sometimes so close together and so profound that it seemed almost that the mountains might collapse. This work had not continued long when reports began to be circulated,

gradually reaching the ears of the outer world, that relics of man were found in these gravels, and controversies arose in which the religious press took a lively part, combating the idea that traces of man could be found in formations that antedated the days of Adam, as these gravels evidently did. Mr C. D. Voy of Oakland, Dr Perez Snell of Sonora, and others collected various relics reported to have come from the gravels, and secured some data relating to their origin; but the matter was never brought to a focus until Professor Whitney became interested in the discoveries and in the early sixties began with his assistants to visit the district and to collect and collate the scattered but remarkable observations.

WHITNEY'S RESEARCHES AND CONCLUSIONS

Professor Whitney found that the gold-bearing gravel deposits were, in the main, very old; that their formation began at least in middle Tertiary time and continued down to the end of the Pliocene period, and in fact in varying degree down to the present time. Examining the evidence with the utmost care, he found it impossible to avoid the conclusion that many of the relics of man and his arts came from those portions of the gravels that could with reasonable certainty be assigned to the Pliocene; that these finds were associated with the remains of extinct species of animals and plants; that they represented a race of ordinary physical characters, though having a culture of the lowest range compatible with the human status. He pointed out that a prominent feature of the evidence was its coherency; coming from a multitude of independent sources and from widely distributed localities it all pointed in one direction. There was no suggestion of the manufacture of evidence and no apparent motive for deception. The observations were all those of miners, but a "long chain of circumstantial evidence is frequently more convincing than a single statement of an [expert] eye witness."[1] Since

[1] *Auriferous Gravels*, p. 260.

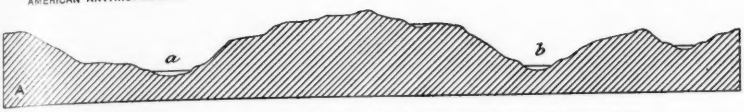
Whitney's time the evidence has been strengthened by Becker, and especially by his statement that Mr Clarence King, Director of the Survey of the Fortieth Parallel, found a pestle in the tufaceous deposits under the lava cap of Tuolumne table mountain and removed it from the matrix with his own hands.

It is impossible not to be deeply impressed by the amount and consistent nature of the evidence presented; yet such is the magnitude of the proposition to be sustained that even this testimony seems inadequate, and we seek by reëxamination and renewed research to determine its exact strength and true significance.

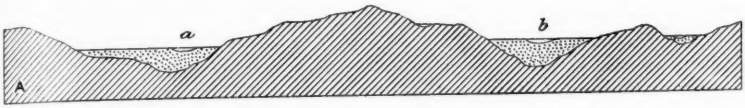
AGE OF THE AURIFEROUS GRAVELS

The substantial correctness of the geologic determinations of Whitney has recently been made fully apparent by the able geologists of the U. S. Geological Survey. It was expected by many students of the subject that the relic-bearing gravels would in time prove to be younger than Whitney believed; that they would be found to correspond in age with the Glacial period—possibly with the closing episodes of that period as determined in the eastern states; and others were confident that they would prove to be even post-Glacial; but instead of this, Becker, Lindgren, Turner, and Diller have extended the gravel-forming epoch to cover the Miocene and probably the greater part of the Eocene, thus making comparisons with the close of the Glacial period hardly more reasonable than the attempt to include the whole group of phenomena within the period of biblical record. To say that they were ten times or a hundred times older than the Glacial period, as represented by the greatest extension of the ice in Ohio and Delaware valleys, would probably not be doing justice to a lapse of time that can be expressed only in several geologic periods.

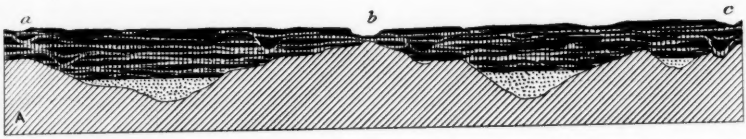
As many readers may not be familiar with the geologic relations of the Auriferous gravels, and hence find themselves unable



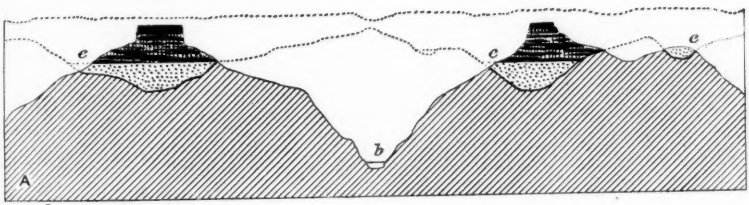
1—Section showing conditions in early Tertiary time. *A*, Auriferous slates; *a*, *b*, stream beds.



2—Conditions at close of great gravel-forming period and before volcanic activity began. *A*, Auriferous slates; *a*, *b*, river beds clogged with auriferous gravels.



3—Conditions at close of volcanic period; valleys filled up and mountains buried with eruptive formations. *A*, Auriferous slates; *a*, *b*, *c*, river channels.



4—Conditions today. Rivers in channels 2000 feet deep. Remnants of volcanic deposits and old river gravels capping mountain summits, *e*, *e*. Old profiles shown by dotted lines.

TRANSVERSE SECTIONS OF RIVER CHANNELS, AURIFEROUS GRAVEL REGION, AT FOUR WIDELY SEPARATED PERIODS

to form definite notions of the great lapse of time and the vast transformations of nature with which we have to deal, it may be well to present briefly the main features of the later geologic history of the region. The accompanying sections, with appended data, will serve to tell the story so fully that a few words only will be necessary to make it fully understood. In early Tertiary times the prototypes of the modern rivers ran out from the sierra down through the highland to the sea pretty much as they do today. The valleys were not so deep as now, as indicated in 1, plate V, but they had strong currents and rapidly scored down the gold-bearing formations which they traversed, filling the channels with coarse, waterworn debris to the depth of hundreds of feet and depositing the freed gold along their beds. This phase of progress is indicated in 2, plate V. It is from these gravels that some of the finds of human relics are reported, and it is therefore affirmed that along the banks of these ancient rivers the first human beings of which we have a trace lived and pursued their varied avocations.

But there came over this region a momentous change. A period of great volcanic activity set in, and streams of lava and rivers of mud descended from the sierra, filling up the valleys; new channels were eroded to be filled in their turn, one system of drainage succeeding another for a prolonged period, at the close of which the deepest valleys were filled to the brim, as shown in 3, plate V; and when the flows of basalt—the final products of vulcanism—ceased, the waters of the high sierra began the work of laying out the drainage system that has come down to the present time.

Since that remote day the region has been elevated to greater heights; the Merced, the Stanislaus, the Tuolumne, the American, the Yuba, and other streams have cut their channels by the slow processes of erosion down to profound depths and now run their courses in valleys two thousand feet deep and many miles in width—gorges so profound, precipitous, and vast that it is a

day's journey to cross them even where the hand of the enterprising gold hunter has ventured to blaze the tedious way. The striking character of the present profile is shown in 4, plate V, by reference to which it may be seen that the cutting of the present valleys to such great depths has left the old stream-beds with their deposits of gravel, their treasures of gold, and (it is alleged) their relics of humanity high up toward the mountain summits (*e*). Here the miners seek and find the gravel outcrops and follow them far into and even through the ridges, the meanderings being so clearly defined that the courses of many of the Tertiary streams have been traced and laid down on the maps and the old river systems practically restored.

Those who get little idea of the lapse of time not expressed in years must fail to comprehend what vast ages are suggested to the geologist by the terms Eocene, Miocene, Pliocene, Pleistocene, and Recent, but the magnitude of the events involved—the entire obliteration of the old topography and the carving out of a new California, including such gorges as the Yosemite and the still more sublime Hetch-Hetchy—will readily be appreciated, and must make a deep impression on every mind and lead to hesitation in accepting the propositions that man matured before these events were initiated and that he has witnessed and survived their consummation.

CATEGORIES OF GRAVEL FINDS

Having reached satisfactory and apparently final conclusions respecting the age of the Auriferous gravels themselves, it is in order to examine the various groups of associated phenomena with which archeologists must concern themselves. There are four categories of data to be considered:

A. The animal remains (lower orders),
B. The plant remains,
C. The remains of man,
D. The remains of human handiwork.

A. The animal remains found in the gravels in fossil state represent a large number of species, chiefly mammals, identified by Dr Joseph Leidy. Whitney enumerates the following forms: Mastodon, elephant, rhinoceros, horse, camel, tapir, ox, llama, deer, wolf, and dog. These are all of extinct species, and although some may have existed down to post-Pliocene time, as indicated by Dr Becker, they fall as a group naturally within the Neocene age.

B. The fossil plants of the gravels secured in Whitney's time were studied by Dr Leo Lesquereux, and by this eminent authority were called Pliocene, although he found many forms that could with equal justice be assigned to the Miocene. Extensive collections obtained in more recent years have been identified by Ward and Knowlton, and it is agreed that on the whole they represent early rather than late Neocene forms, that they are clearly of middle Tertiary age. According to Professor Knowlton there is not one species which can undoubtedly be identified with living forms.[1]

C. Human remains reported from the gravels are not plentiful, and all that appear to have been preserved are an imperfect human cranium known as the *Calaveras skull* and a few unimportant fragments of another skull. Fragments of skulls and various bones of the body have been reported from the old gravels in a number of localities. These remains, and especially the Calaveras skull, indicate a man not differing materially from the California Indian of today, although said by Whitney to present some characteristics of the Eskimo.

D. The remains of human handiwork to be considered are, on the other hand, quite numerous. Many hundreds of specimens have been reported from the gravels and are believed, in a general way, to belong to the Neocene deposits. According to the finders, many of them were intimately associated with the

[1] Lindgren and Knowlton, *Age of the Auriferous Gravels* (*Journal of Geology*, vol. IV, No. 8, p. 905).

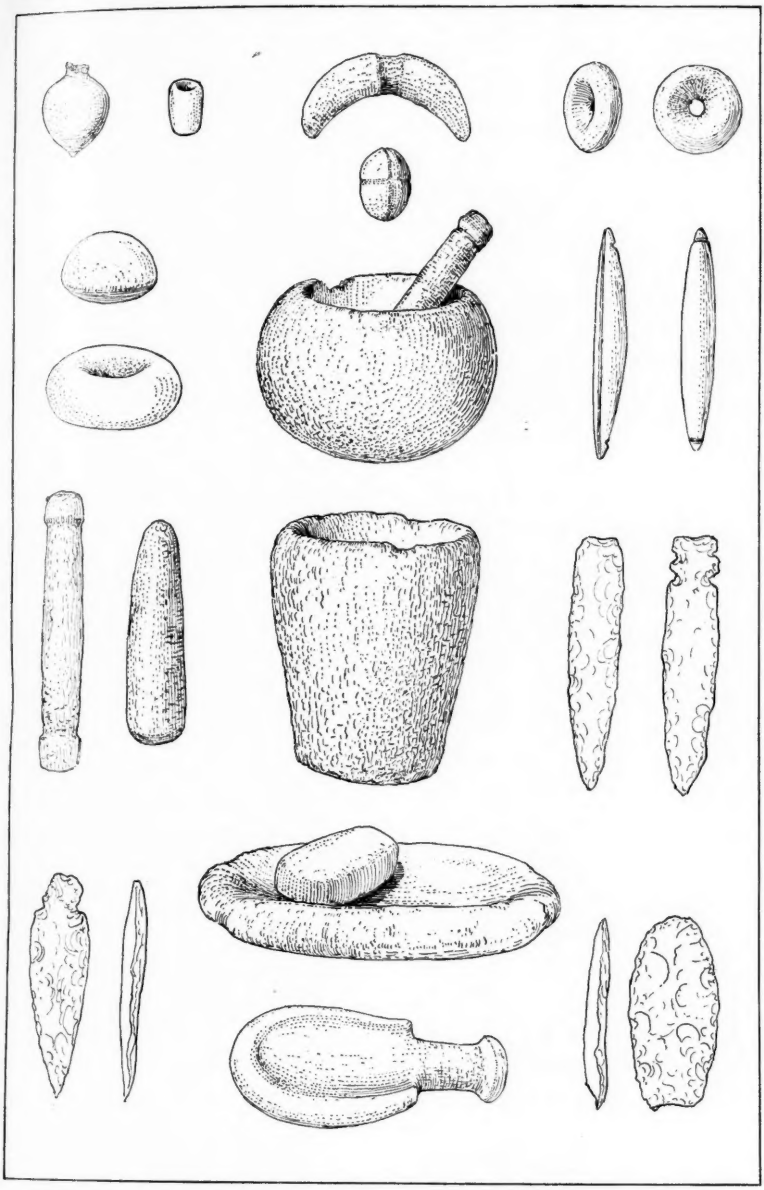
remains of fossil animals and plants, and some appear to be from gravels that antedate the volcanic era.

INCONGRUITIES IN THE EVIDENCE

In comparing these four groups of remains we observe that the fossil animals belong without exception to extinct species, that the plants are likewise extinct, and that all of both groups take their place naturally within the limits of the Neocene. When, however, we examine the human remains, we are met by the striking fact that they do not represent an extinct form, or even a well-marked variety of *Homo sapiens*, but a people structurally identical with ourselves; and it therefore takes a great stretch of the imagination to conceive that this man could have formed part of a fauna every other mammalian member of which has succumbed during the uncounted ages of succeeding geologic periods.

On examining the art remains it is found that they also seem out of place in Tertiary times, that they present a decidedly modern aspect. Of the fifteen or twenty varieties reported from the gravels by Whitney and others, all are of recent types—are identical with the stone implements used by the native tribes of California today or in the recent past. If these forms are really of Tertiary origin, we have here one of the greatest marvels yet encountered by science; and perhaps if Professor Whitney had fully appreciated the story of human evolution as it is understood today, he would have hesitated to announce the conclusions formulated, notwithstanding the imposing array of testimony with which he was confronted. To suppose that man could have remained unchanged physically; to suppose that he could have remained unchanged mentally, socially, industrially, and esthetically for a million years, roughly speaking, (and all of this is implied by the evidence furnished,) is to suppose a miracle.

Professor Whitney believed the implements found were just



IMPLEMENTS AND UTENSILS SAID TO HAVE BEEN DERIVED FROM THE AURIFEROUS GRAVELS

The figures included in the plate are copied from hasty sketches and do not assume to be exact. They serve, however, to indicate the general character of the finds. It is expected that photographic reproductions of the objects will be given in a final paper.

such as might be expected of a Tertiary man, and observed: "It has been always the same kind of implements which have been exhibited to us, namely: the coarsest and least finished which one would suppose could be made and still be implements."[1] But on examination we find that they are really of advanced types, and comprise the following varieties: Mortars (several forms), pestles (numerous forms), platters (dishes, metates), mullers (rubbing stones), hammerstones, handled ladles ("scoops"), plummet stones, rings of stone ("doughnuts"), pitted disks, shuttle-shape stones, grooved pebbles (hammerheads, sinkers), crescent stones, spearheads, arrowheads, knives, and broad blades, to which may be added stone beads and wampum.

The series of sketches presented in plate VI will convey a definite idea of the character of some of these objects and make apparent their practical identity with the familiar relics of our California tribes. The assertion that man shaped and used this group of artifacts in Tertiary times and continued to use them without change, without improvement or retrogression, down through the ages, through complete transformations of land and sea, and the extinction of all known living things, should be supported by proof more conclusive than anything yet adduced.

To suppose again that the ancient people disappeared as a result of nature's mutations, leaving their bones and handiwork in the stream beds of the Neocene period, and that another people, springing up or appearing on the same spot in recent years, have duplicated each and every character, activity, and art form, is to suppose the impossible.

Another consideration is interesting in this connection. Should we feel compelled to concede the existence of a race of advanced stone-age culture, such as that suggested by the group of artifacts presented, it would necessitate the further concession that the origin of the race was to be looked for in a still earlier period, for the best experience of anthropologists goes to

[1] *Auriferous Gravels*, p. 279.

show that early steps in culture are hesitating and slow, that the various steps which, in the normal order of culture progress, precede the era of polished stone, must have been of very great length; and should we adopt the conclusion of Whitney that no considerable advance in culture took place in California between Tertiary times and the present, and take this as a reasonable index of the rate of progress, we should have to look for the cradle of the race somewhere in the remote ages of the Mesozoic.

It may further be noted that the biologist, accustomed to regard animate nature from the point of view of the theory of evolution, will find it difficult to accept conclusions that would place the perfected man, the highest type of the highest order of animal life, the mammalia, too near the beginning of a series that ought in the natural order of things to show definite indications of progressive change.

EXAMINATION OF THE IMPLEMENTS PRESERVED

Turning now to the objects of art described by Whitney and others and preserved in the museum of the University of California and elsewhere (plate VI), we inquire more fully into their character and appearance. Whitney has said that the gravels were deposited by streams having violent currents, that the bones of animals were torn asunder and scattered, and that all objects were necessarily more or less worn; but it is observed that not one of the art objects attributed to the gravels shows the least sign of rough usage or wear; the marks they display of the tools used in flaking, pecking, grinding, and polishing are as fresh as in the implements and utensils found on modern Indian sites. This fact is so significant that it cannot be passed over without consideration.

Glancing again at the numerous implements, utensils, and ornaments attributed to the Auriferous gravels, we may inquire, What materials are represented? There are several varieties of stone, including granite, andesite, rhyolite, slate, obsidian, etc.

Andesite, however, prevails, and at least three-fourths of the objects are of this material. As most of these rocks in their original distribution are confined to somewhat limited portions of the geological column, some early and others late, it is proposed to inquire whether any of the specimens are of materials later in origin than the strata in which they are said to have been found. Full data are not yet at hand for a satisfactory analysis of this point; but it may be mentioned that andesite specimens are reported from horizons extending all the way from the earliest to the most recent gravels, yet so far as our geologists have gone this rock is not found in the formations of the particular region until toward the close of the Neocene. The objects being generally large, it is not to be supposed for a moment that they could have been brought from a distance. Again, obsidian is, generally speaking, a late product, having its origin in the most recent flows of the sierra, yet we have obsidian implements reported from the gravels of various districts, and in one case, at least, from deposits that must belong very near the initial stages of eruptive activity. This interesting line of research remains to be followed up until definite results are reached; this, however, cannot be done until the geology of the region is more exhaustively studied.

OBVIOUS SOURCES OF ERROR

It was not expected that a short visit to the Auriferous gravel region would lead to a final settlement of the whole question of Auriferous gravel man, for the task is a most difficult one. The recorded observations on which the structure of a Tertiary man is built cannot be made over again or satisfactorily tested, and new observations of a crucial nature must necessarily be of very rare occurrence. However, a reasonably intimate knowledge of the region and its phenomena was gained, and a foundation was laid for future research and for intelligent judgment as to the value of the extensive body of testimony already on record.

On reaching the mining region attention was turned first toward the nature, age, and relations of the gravel deposits, to the topographic character of the district, and to the profound changes brought about by the mining operations. Thanks to the thorough work done by our geologists, all of these matters were readily mastered, and nothing need be added to what has been said respecting them in preceding paragraphs.

In the second place, a study of the implements and utensils, ancient and modern, of the general region was made in order that comparisons might be instituted between them and the gravel finds. The results of this comparison have already been referred to, but further mention of the topic will later be made.

A third line of investigation related to the distribution of the aboriginal tribes and their relation to the mining areas and mines, and in this direction very significant observations were made. Indian village sites are scattered over the hills and tablelands, and ancient Indian sites were found everywhere. At Nevada City, Nevada county, a "Digger" Indian village was encountered on the margin of the tableland overlooking the great gravel mines a mile west of the city. Its people were engaged in gathering acorns and grinding them in mortars of various shapes; some of the mortars were worn in outcropping masses of granite, or in large, loose bowlders, while others consisted of flattish or globular masses of stone more or less modified in shape by artificial means; and it was realized that, as the hydraulic work progressed in the mine below, this site would be undermined and that one by one the utensils would drop in and become intermingled with the crumbling gravels, possibly to be recovered later with every appearance of having been imbedded with these deposits when they were laid down unnumbered centuries before. One of the mortars reported by Whitney was obtained from a mine on the western slope of this same hill, and it is easy to see how it could have rolled in from an Indian camp-site above, either before or during the prosecution of mining operations. The conditions observed

1—Weathered gravel wall 200 feet in height, with ancient village site above

2—Margin of mine with ancient village site in the distance

VIEWS IN DARDANELLES MINE SHOWING POSITION OF ANCIENT VILLAGE SITE

here were repeated at nearly every mine visited in Nevada, Placer, Eldorado, and Calaveras counties. At Forest Hill, Placer county, the Dardanelles mine, extensively worked in the early days by Richard Clark and others, has undermined and obliterated a half or more of a terraced spur or "flat," as such features are called in that country, formerly occupied by an Indian village. (See plate VII.) According to Mr Clark, who still resides in Forest

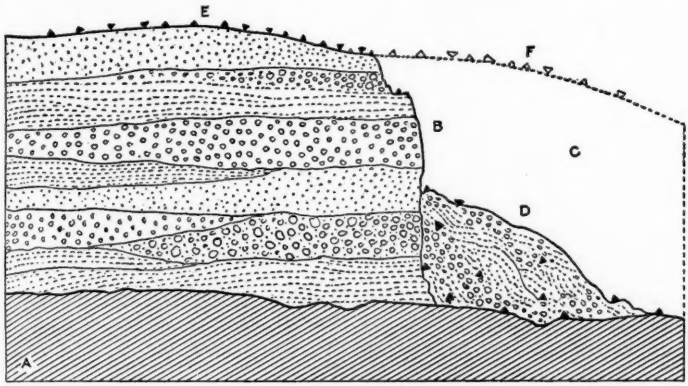


Fig. 2.—Section Showing Relations of Ancient Village Site to Gravel Mine.

A, Auriferous slates—bed-rock; *B*, Auriferous gravels, 250 feet thick; *C*, Great excavation made in gravels by hydraulic mining; *D*, Crumbled gravels, result of caving in; *E*, Ancient village site; *F*, Portion of village site destroyed by mine. The dark triangular figures in the talus show the distribution of artifacts resulting from mining operations.

Hill, this site has not been occupied by the natives since work began in the mine in 1852; but an hour's search brought to light a dozen mortars and grinding stones, twenty or thirty rubbing stones and pestles, together with several varieties of smaller tools. As the ground of the site sloped toward the mine, most of the larger, and especially the rounder objects, must long since have rolled into the great pit (figure 2), the gravel walls of which are, on the one side, upward of two hundred feet in height. Many of the objects obtained were already in the gullies leading into the mine, and each year numbers must have gone over to become intermingled with the gravels, where they would remain for good unless

some observant miner happened to bring them to light. Specimens thus found, falling into the hands of such collectors as C. D. Voy, would naturally be added to the growing list of Tertiary gravel relics. The flat dish or platter found by Voy in this or a neighboring mine[1] is identical in type with several of the specimens from the village site on the brink of the mine. A rough, roundish mortar and a small handstone were found by Professor McGee on a ledge thirty feet below the brink of this mine where they had fallen from above; and at Todd's valley, a few miles farther southward, a roundish bowlder some three feet in diameter, having a neatly shaped mortar in one side of it, was found resting on the bed-rock of a deep mine. This specimen had undoubtedly fallen in from above. An Indian dwelling was situated on the rim of the mine near by, and about it were scattered mortars of all kinds. A brush shelter in which the women grind acorns, a little higher up than the dwelling, contained at least a dozen pestles, both flattish and cylindrical in shape.

These significant relationships of Indian village sites and gravel diggings were repeated everywhere, and although Whitney observed the presence of the "Diggers," he made the mistake of supposing they used only fixed mortars, that is, those worked in the surface of large masses or outcrops of rock. The fact is that portable mortars and grinding stones of diversified forms are and have been used by Indians in all parts of California. It is not to be supposed that miners would pay much attention to the origin of relics found by them in the mines, since they attached no particular significance to them; so that between the unwary geologist, the unthinking miner, and the professional collector cultivating a prolific field, it is to be expected that a good many mistakes would be made.

No one can venture to say just what percentage of the finds reported by Whitney and accepted by him as evidence of antiquity are of the class here described, but certainly a large pro-

[1] *Auriferous Gravels*, p. 277.

portion may be assumed; and the observations made above cast a shadow of doubt over all specimens corresponding to known Indian forms reported from open mines, from such shafts and tunnels as do not extend beneath undisturbed formations, or from positions where any kind of post-Tertiary disturbance could have taken place.

In a second paper I hope to review the evidence further, and especially to present some data relating to the Calaveras skull.

PROFESSOR BLUMENTRITT'S STUDIES OF THE PHILIPPINES

By DANIEL G. BRINTON

Now that the Philippine islands are definitely ours, for a time at least, it behooves us to give them that scientific investigation which alone can afford a true guide to their proper management. Here, as everywhere, man is the most important factor in the problem of government, and a thorough acquaintance with the diverse inhabitants of the archipelago should be sought by everyone interested in its development.

At present, I wish to direct attention to the articles on the Philippines of an author who stands easily first among scientific writers upon them, and who has devoted his life to investigations concerning them—I mean Prof. Ferdinand Blumentritt.

This is the more seasonable, as very few readers are aware of the multitude of his articles, composed as they are in several languages and issued in publications widely asunder in time and place; and yet it is indispensable for everyone desirous of learning the ethnology of the Philippines to consult many of them. I have a number of these writings in my possession, besides the titles of others, making 146 in all, published since 1880.

It would be impossible to do justice to this mass of literature in the space at my disposal. I shall therefore mention only the most valuable to the anthropologist, arranging them in the same order in which I reviewed the ethnography of the Philippines in the *American Anthropologist* for October, 1898.

General Works.—The most extended survey of the subject is his "Ethnography of the Philippines," printed as a supplement to *Petermann's Mittheilungen* in 1882. But this, in a measure,

has been supplanted by his "Alphabetic List of the Native Tribes of the Philippines," published in the Berlin *Zeitschrift für Erdkunde*, 1890, with an important supplement in the same journal for 1893. The study of this list is indispensable to everyone who would acquaint himself with Philippine ethnography, and it ought to be translated and republished by our government. Under the title *Las Razas del Archipélago Filipino*, an early rescript of it, with a map, was printed in the *Boletin* of the Geographical Society of Madrid, in 1890.

Of articles of general ethnologic interest I may mention one on the census of the individual tribes (*Bijdragen tot de Taal-, Land- en Volkenkunde*, etc., 1890); on the ancestor worship and religious opinions of the Malayan tribes (*Mittheilungen* of the Geographical Society of Vienna, 1882); on the proper names of the natives and their significance in a religious sense (*Zeitschrift für die Kunde des Morgenlandes*, 1894); and on the governments of the native village communities (*Globus*, 1881).

The Negritos.—Concerning these aborigines, who are ethnographically most interesting, Professor Blumentritt's articles furnish much information. Their language is discussed from missionary sources (*Bijdragen*, etc., 1896); those dwelling in Limay are described (*Ausland*, 1883), and those of Baler (*Mittheilungen* of the Geographical Society of Vienna, 1884); their condition at the period of the conquest is set forth from the most authentic records (*Deutsche Rundschau*, 1884); recent observations upon them are summarized (Berlin *Zeitschrift für Erdkunde*, 1892); those of the province of Pampanga, Luzon, are described (*Globus*, 1882, and *Mittheilungen* of the Geographical Society of Vienna, 1893); those farther north are enumerated (*Globus*, 1884); a general article on them appeared later (*Globus*, 1885), and various brief notices occur in other numbers of the same journal.

Wild Tribes of Northern Luzon.—The name "Igorrotes" is applied by Spanish writers in a vague way to many wild tribes.

Professor Blumentritt has endeavored to assign it a definite ethnographic meaning, which, it is to be hoped, American writers will adopt (*Ausland*, 1882, and in the "Alphabetic List," already mentioned). Special studies are given on the Calingas (*Ausland*, 1891); the Ilocanes (ibid., 1885); the Tinguianes (*Mittheilungen* of the Vienna Geographical Society, 1887); the Ilongotes (*Globus*, 1886, and ibid., 1893); the Zambals (ibid., 1886); and the Gaddanes and Ibilaos (*Mittheilungen* of the Anthropological Society of Vienna, 1884).

The Tagals and Bicols.—The ancient customs of the Tagals, from the manuscript of Juan de Placencia, are narrated by Professor Blumentritt (*Zeitschrift für Ethnologie*, 1893), and their creation myths also are related (*Globus*, 1893). Interesting facts about the Bicols, from Father Castaño, are added (*Mittheilungen* of the Vienna Geographical Society, 1896).

The Bisayas.—Under this vague term we may include the natives of Mindanao and the central islands. Those of Mindanao have been studied by Professsor Blumentritt in various articles (*Mittheilungen* of the Vienna Geographical Society, 1886; ibid., 1891; *Petermann's Mittheilungen*, 1891; *Globus*, vol. 71; *Ausland*, 1890; *Zeitschrift für Erdkunde*, 1896). To the natives of Palawan, several articles have been devoted (*Deutsche Rundschau*, 1884; *Globus*, 1891). The Manguianes of Mindoro, so vividly described by Professor Worcester, are depicted in an earlier notice (*Globus*, 1886, and also vol. 69); as are also the mountain-dwellers of the island Negros (*Mittheilungen* of the Vienna Geographical Society, 1890), and the natives of the Marine islands (*Globus*, 1884).

The Moros.—The Sulu islands and their Mohammedan inhabitants are the subjects of papers by Professor Blumentritt in the *Boletin* of the Geographical Society of Madrid, 1891, and in *Globus*, 1880, 1881, 1882. They should be the more carefully considered, as these piratical fanatics offer the most serious problem in the pacification of the islands.

This list gives but an inadequate account of this author's pro-

found studies of the Philippines and their conditions. He has published also numerous contributions on the dialectic Spanish there in use; on their industrial products and commercial relations; on the deposits of coal and gold; on the immigration and labor questions; on the volcanic systems; on the missions and their influence; on the causes of the revolution; on the native dialects; and on general political questions.

As no one is better informed than Professor Blumentritt on the actual mental status of the Filipinos, it will interest readers to learn that he is positive they are sufficiently advanced to be capable of independent self-government, and it is his ardent wish that this shall be the outcome of our wresting them from Spanish misrule.

THE INDIAN CONGRESS AT OMAHA

By JAMES MOONEY

Interest in the science of anthropology has grown steadily and rapidly in the last twenty years. The work done prior to that time by various scientific bodies and specialists, although good so far as it went, was yet desultory in execution and appealed only to a small circle of scholars, while it remained all unknown to the great body of educated people. The establishment of the Bureau of Ethnology in 1879 marked an era in the history of the science. Its *Annual Reports*, its *Contributions* and *Bulletins*, prepared by recognized experts and brought out usually in a high style of the bookmaker's art, have been distributed by tens of thousands to libraries, scientific bodies, and people of liberal intelligence all over the country—and in fact all over the world—until today there is not in the United States a community of any importance where these volumes are not known by the sort of people who make public opinion.

Largely through this influence local research has been encouraged and organized society effort stimulated, chairs of anthropology have been established in our leading universities, ethnologic expeditions have been fitted out at private cost, and an intelligent public interest has been awakened which finds its reflex in congressional legislation. In 1879 Congress appropriated $20,000 for ethnologic research. In 1899 it appropriates $50,000 for the same purpose, and if, as now seems possible, we should be called on to make color studies in the tropics, we may yet live to see the sum reach the $100,000 mark. Last year also, for the first time, the management of a great exposition asked and obtained a special appropriation for ethnology.

The Trans-Mississippi and International Exposition held at Omaha from June to October, inclusive, in 1898, was the most successful ever held in this country, from the Centennial down, not even excepting the World's Fair. Conceived in a period of widespread business depression and carried through in the face of a foreign war, it closed with a record of over two and a half million paid admissions and a balance of several hundred thousand dollars in the treasury. Such a showing, in a town whose citizens only thirty years ago were called upon to barricade their homes against an attack of hostile Indians, well illustrates the rapid growth and tremendous energy of the west, and the grit and determination of the exposition managers, foremost among whom was Edward Rosewater, proprietor of the *Omaha Bee*. The successful outcome was due chiefly to his tireless activity and unfaltering courage. The ethnologic project was the child of his brain, and in spite of serious imperfections, the general result was such—particularly from the practical standpoint of the ticket seller—that we may expect to see ethnology a principal feature at future expositions so long as our aboriginal material holds out. Indeed, the projectors of one or two contemplated expositions, after looking over the ground at Omaha, have already included an Indian exhibit on a large scale as a part of their plans.

While in Omaha in October, 1897, the author drew up, at the request of the management, an elaborate plan of ethnologic presentation at the exhibition, based on a plan already submitted some years before to the late Professor Goode for possible use in connection with the Columbian National Park. Briefly summarized, the scheme was based, not on linguistic or tribal affiliations, but on modes of life as determined by surroundings. However, congressional delays and unexpected governmental expenditures, consequent upon the breaking out of war with Spain, prevented the carrying out of any systematic project.

On the convening of Congress in December, the friends of the exposition introduced a bill appropriating $100,000 for an

ethnologic exhibit. It reached the conference stage with prospects bright for its passage, but before it could come to final action the war preparations monopolized legislative attention, with a consequent scaling down of appropriations all along the line. It was found impossible to effect the passage of the bill as contemplated, and it was finally incorporated as a paragraph, but appropriating only $40,000 instead of the sum first named, in the Indian appropriation bill, which became a law on the last day of June, a full month after the opening of the exposition. The work was thus taken out of the control of the management, while no time was left for adequate preparation.

In anticipation of the passage of the bill the Indian Office had sent out to the various Indian agents an explanatory circular, setting forth the purpose of the appropriation. We quote as follows:

"It is the purpose of the proposed encampment or congress to make an extensive exhibit illustrative of the mode of life, native industries, and ethnic traits of as many aboriginal American tribes as possible. To that end it is proposed to bring together selected families or groups from all the principal tribes, and camp them in tepees, wigwams, hogans, etc., on the exposition grounds, and there permit them to conduct their domestic affairs as they do at home, and make and sell their wares for their own profit.

"It is desired that the encampment should be as thoroughly aboriginal in every respect as practicable, and that the primitive traits and characteristics of the several tribes should be distinctly set forth. This point should be constantly kept in view in the selection of the Indians and in the collection of materials. They should bring their native dress, if possible. They should also bring their native domiciles or the materials with which to make them. They should also bring the necessary articles with which to furnish and decorate their tepees or other domiciles. As this will be a most interesting part of the exhibit, the furnishings should be as attractive and complete as possible. The necessary materials for carrying on their native arts should also be brought, so that they may engage in making articles for sale on the grounds. Where this cannot be done they may bring things illustrative of their craft in reasonable quantities for sale."

Unfortunately the execution of the project was intrusted to an official unacquainted with tribal characteristics, arts, or ceremonies. As a result, no one of the leading native industries was represented—blanket weaving, pottery making, silver working, basket making, bread making, or skin dressing. Not even the characteristic earth lodge of the Omaha Indians was shown, although such houses are still in occupancy on the reservation less than sixty miles distant. The ethnologic results obtained were the work of an expert detailed at the special request of the management and were paid for outside of the appropriation.

The first Indians arrived in August, when the exposition was already half over, and they continued to come in by delegations and singly until the close. Some went home after a short time, but the majority remained to the end. The number contemplated in the estimates was 500, the actual number present varying from about 400 to about 550. Filtered water for drinking was supplied to the camp, and daily rations were issued nearly equivalent to the regular army ration. There were three deaths —a Sauk warrior, who was buried in full Indian dress, and two babies. Two infants were born during the encampment.

Omitting several delegations which remained but a short while, there were represented about twenty tribes, viz.: Apache, Arapaho (southern), Assiniboin, Blackfoot, Cheyenne (southern), Crow, Flathead, Iowa, Kiowa, Omaha, Oto, Ponka, Potawatomi, Pueblo (of Santa Clara), Sauk and Fox, Sioux, Tonkawa, Wichita, and Winnebago. The Apache were in two delegations, the Chiricahua now held as prisoners at Fort Sill, Oklahoma, and the San Carlos delegation, coming directly from Arizona. With the latter were several Mohave. The Flathead delegation included also some Spokan and Kalispel. The Kiowa were properly Kiowa Apache, practically a part of the Kiowa in everything but language. There were several delegations of Sioux, mainly from Rosebud and Pine Ridge agencies in South Dakota. The Wichita delegation included one or two individuals of the nearly

extinct Kichai, while with the Tonkawa, themselves on the verge of extinction, was a single woman of the broken tribe of the Lipán.

A glance at the list will show that four-fifths of the Indians thus brought together represented but a single type, the ordinary tipi tribes of the plains. The wood carvers of the Columbia, the shell workers and basket makers of Oregon and California, the Navaho weavers, the Pawnee—aboriginal owners of Nebraska,—the tribes of the gulf states, now living in Indian Territory, and the historic Iroquois of the long-house were unrepresented.

Linguistically, the tribes are classified as follows: ALGONQUIAN STOCK—Arapaho, Blackfoot, Cheyenne, Potawatomi, Sauk and Fox; ATHAPASCAN STOCK—Chiricahua Apache, San Carlos Apache, Kiowa Apache, Lipán; CADDOAN STOCK—Wichita, Kichai; SALISHAN STOCK—Flathead, Spokan, Kalispel; SIOUAN STOCK—Assiniboin, Crow, Iowa, Omaha, Oto, Ponka, Sioux, Winnebago; TANOAN STOCK—Santa Clara Pueblo; TONKAWAN STOCK—Tonkawa; YUMAN STOCK—Mohave.

We shall now speak in detail of some of the tribes, beginning with one of the most interesting. The Wichita, with their confederates, the Waco, Tawákoni, and Kichai, numbering now altogether only about 320, belong to the Caddoan stock, and reside on a reservation in southwestern Oklahoma. The first three are practically one people and speak a dialect of the Pawnee language, the Tawákoni particularly claiming close relationship with the Skidi division of the Pawnee. The Kichai, reduced now to about 60 souls, are the remnant of a tribe from eastern Texas, with a distinct language of their own. The Wichita call themselves *Kitikittsh*, meaning literally, "racoon eyelids," but understood to signify "tattooed eyelids," from a former custom among the men of tattooing lines upon the eyelids. The women tattoo lines upon the chin, and some of the older ones have their breasts covered with tattooed designs. From this custom the Wichita derived their French name of Panis Piqués. The common name of

the tribe has been variously explained, but may be connected with *wits*, or *wets*, their own word for "man."

Within the historic period, which in their case dates back more than three centuries, they have ranged from central Texas to Arkansas river, and there is evidence that at one time a part of them at least lived farther eastward in Arkansas and Louisiana. They are identical with the people of the ancient Quivira, with whom Coronado, in 1541, found "corn and houses of straw." At the beginning of their official relations with the government the Waco and Tawákoni were in Texas, about the present Waco city and Tawákoni creek, while the Wichita and Kichai had their permanent village in the Wichita mountains, on upper Red river. Driven out of Texas by the whites, they were collected on the present reservation in 1859, but had hardly gathered their first crop when they were again scattered by the outbreak of the civil war, and fled north, remaining about the site of the present city of Wichita, Kansas, until the struggle was over, when they returned to their homes on the reservation. They have never been at war with the whites.

Like all the tribes of Caddoan stock, the Wichita are an agricultural people, and even before the coming of the white man raised large quantities of corn, which they ground into meal upon stone metates or in wooden mortars, or boiled in pottery of their own making. Their surplus supplies were deposited in cistern-like caches lined with bark.

Their permanent houses are of unique construction, being dome-shape structures of grass thatch laid over a framework of poles, with earth banked up around the base. From Catlin we have a picture of such a village, as he found it, on upper Red river in 1834, but, as is the case in other of his drawings, with the forms somewhat idealized. It may be mentioned that the circular embankments on this village site were plainly to be seen when the writer identified the location a few years ago. In making up the Wichita delegation for Omaha a typical grass house

was bought from the owner, on the reservation, with the understanding that it should be taken down and the materials transported in Indian wagons to the railroad, thirty miles away, thence to be shipped to Omaha, to be again set up on the grounds of the Indian congress. The contract was faithfully carried out. The grass house was taken down, transported by wagon and rail, and again set up in the original materials at Omaha, the rebuilding requiring the labor of several women about one week.

The inside support was a substantial square framework of stout logs, about eight inches in diameter, planted upright in the ground, supporting cross-pieces of the same size laid in crotches at the top. Over these cross-pieces were bent long, flexible, half-round timbers, having their bases planted in the circular trench which formed the circumference of the structure, while their tapering ends were brought together at the top and bound firmly with elm bark to form the rafters. Smaller flexible poles of perhaps an inch in diameter were then bound across these at regular intervals from the ground to the top. Over this framework the long grass was laid in shingle fashion in regular rounds, beginning at the bottom, each round being held in place by light rods fastened with elm bark to the supporting framework and cleverly concealed under the next round of grass. Near the top, but at the side instead of in the center, was the smoke-hole. Doorways were left at opposite sides to allow the breeze a free sweep, and detached doors were made of grass over a frame of rods. Around the inside were high bed platforms, and in the center was the fire-hole, with a support from which to hang the pot. There was also a grass-thatched arbor built in the same fashion, with a sweat-lodge of willow rods. A curiously painted Indian drum, which they brought with them, hung up on the outside, the mortar and the metate near the doorway, and the bunches of corn and dried pumpkin, with the Indian owners themselves, made the Wichita camp altogether perhaps the most attractive feature of the congress.

At the close of the exposition the grass house, with the mortars and metates, was purchased for the National Museum, and the materials transmitted to Washington to be again set up in the Columbian Park, where future visitors may have opportunity to study the structure of the "straw houses" of old Quivira.

The Wichita delegation numbered thirty-eight, of whom fifteen lived in the grass house, while the remainder occupied several canvas tipis adjoining. The party had been carefully selected, and included several noted runners distinguished in the ceremonial foot-races of the tribe, two Kichai women, still retaining their peculiar language, and one of them with the old-style tattooing upon her face and body, and a mother with an infant in a cradle of willow rods. Physically the Wichita are dark and generally of medium size, with flowing hair inclined to waviness. They were accompanied by their chief, known to the whites as Tawákoni Jim, a man of commanding presence and fluent eloquence, and in former years a scout in the service of the government.

Another interesting southern tribe represented was that of the Kiowa Apache, now numbering about 220, on a reservation in southwestern Oklahoma, adjoining the Wichita. Although closely associated with the more numerous Kiowa, they are of Athapascan stock, coming originally from the far north. They call themselves *Nadł-ishañ-Dina*, and are mentioned under their Pawnee name of Gátaka in a French document of 1682, being then in the same general region where they became better known at a later period, participating with the Kiowa in all their raiding wars until assigned their present reservation in 1869. Until within a few years past they have been a typical plains tribe, without agriculture, pottery, or basketry, depending entirely on the buffalo for subsistence, and shifting their skin tipis from place to place as whim or necessity guided. They hunted and fought on horseback, carrying the bow, the lance, and the shield (and

more recently the rifle), and joined with the Kiowa in the great annual ceremony of the sun dance. Physically they are tall and well made, with bold, alert expression.

Every man and woman of the delegation came dressed in full buckskin, beautifully fringed and beaded. They set up their canvas tipis adjoining the Wichita, inclosing one of them with a circular windbreak of leafy willow branches after the manner of the winter camps of the plains Indians. Suspended from a tripod in front of the same tipi was a genuine, old-time "buffalo shield," the last shield remaining in the tribe. It is now the property of the National Museum.

It may be in place here to describe the tipi, the ordinary dwelling of the plains tribes. The name *tipi*, "house," is from the Sioux language and has now almost entirely superseded the former term, lodge.

The tipi is a conical structure, formerly of dressed buffalo hides, but now of cow-skins or canvas, sewn together with sinew, over a framework of poles of cedar or other suitable wood, tied together near their tops and spread out at the ground to form a circle of about twenty feet diameter. An average tipi occupied by a family of about six persons has twenty poles in the circle and stands about fifteen feet high to the crossing of the poles. Three—or with some tribes four—particularly stout poles form the main support of the structure. One of these is at one side of the doorway, which always faces the east; another, to which is usually tied the "medicine-bag" of the owner of the dwelling, is nearly opposite the doorway, while the third is on the north side. These three poles are first tied together about two feet from their upper ends with one end of a long rope, and are then raised in place by the women and firmly planted in the earth. The other poles are next sorted out according to length and leaned against them in such way that when set up the tipi's longest slope will be toward the front. The formula is: three main poles; two sets of five longer poles each, one for each side and extending

around to the doorway; two sets of three shorter poles each, for the back; one pole which is fastened to the tipi covering at the back and serves to lift it upon the framework. There are also two outside poles for the flaps. As each set of poles is put in place another turn of the rope is taken around them at the crossing, and when all are up the loose end of the rope is wound around one of the main poles and firmly tied. The covering being lifted upon the framework, the two ends are brought together in front and fastened with a row of wooden pins running upward from the door, which may be a simple hanging flap, a coyote skin, or something more elaborate. About twenty pegs fasten the edges down to the ground, grass and wild sage being used to fill in any spaces which might admit the cold air. The opening where the poles cross allows the smoke to escape. On each side of the opening is a flap, held in place by two other poles on the outside of the tipi, by means of which the draft is regulated as the wind changes.

The fire is built in a shallow hole dug in the center of the tipi. Behind and on each side of the fire are low platforms, set close against the wall of the tipi, which serve as seats by day and beds by night. The frames are of small poles, supporting mats of willow rods, usually looped up at one end in hammock fashion, and covered with skins or blankets. Above the beds are canopies set so as to catch the stray drops which come in through the smoke-hole during rainstorms. The clear space of ground immediately about the fireplace, where the women attend to their cooking operations, is sometimes separated from the bed space by a border of interwoven twigs. The tipi is painted on the outside with heraldic designs and decorated with buffalo tails, streamers from the poles, or similar adornments. In summer it is set up on the open prairie to escape the mosquitos. In winter it is removed to the shelter of the timber along the river bottom, and surrounded with a high fence or windbreak of willow branches neatly interwoven.

XUM

Such was the dwelling until recently in constant use by all the buffalo-hunting tribes from the Saskatchewan to the Rio Grande, and for a part of the year also by the semi-sedentary agricultural tribes, such as the Ree, Pawnee, and Wichita. No other structure met so well the requirements of the nomad hunters of the plains, as no other is so easily portable and so well adapted by its shape to withstand the stormy winds of a timberless region. This is shown by the fact that it has furnished the model for the Sibley tent. It is still in use by all the plains tribes, with no change from former methods of construction excepting in the substitution of canvas for buffalo hides and in the general inferiority of ornamentation and workmanship.

Of the Kiowa Apache delegation the most prominent member was the hereditary chief, White-man, now nearly seventy years of age, a kindly, dignified gentleman, who has twice represented his people at Washington. In spite of years he sits his horse as firmly and bears his lance as steadily as the youngest of his warriors. In former days he was one of the two war leaders deemed worthy to carry the beaver-skin staff which pledged them never to avoid a danger or turn aside from the enemy. Another notable man is the captive, Big-whip, whose proper name is Pablino Diaz, and who jokingly claims kinship with the distinguished president of the sister republic. He is one of a considerable number of captives still living among these southern tribes, which formerly made Mexico and the Texas frontier their foraging grounds. Unlike most of these unfortunates, Pablino retains the knowledge of his name and his Spanish language, and remembers vividly how he was taken, when about eight years of age, in a sudden dash by the Apache upon the town of Parral in Chihuahua.

With some modification of detail the description of the Kiowa Apache will fit the other plains tribes represented at the congress: the Dakota, Assiniboin, Crows, and Blackfeet of the north; the Omaha, Ponka, and Oto of the central region; and the Cheyenne and Arapaho of the south. With the exception of the

Omaha and Ponka, who are practically one people, they were all roving buffalo hunters, fighting and hunting on horseback, dwelling in skin tipis, practicing no agriculture, using the same weapons, and having similar military organizations and tribal ceremonies. Most of them seem to have been unacquainted with the clan system. The Omaha and Ponka had corn and earth-covered lodges, both of which they probably obtained originally from their allies, the Pawnee. All wore the prairie moccasin, breechcloth, and buckskin dress, differing only in length of fringe or color of decoration. They wore no head covering except for ceremonial purposes. The men wore the scalp-lock, usually having the rest of the hair braided and hanging down in front on each side of the head. With the Crows, and sometimes the Blackfeet, it was pushed up or roached over the forehead. Excepting in the substitution of cloth for buckskin, the majority of these Indians are but little changed in appearance from the time when they were first put on reservations. They are all of fine physical type, as might be expected in a race of warriors and horsemen. The build is sinewy and the features thin and clear-cut, excepting the semi-agricultural Omaha and Ponka, who show the effect of a partial grain diet in rounder faces and portlier figures. The Blackfeet and Crows are especially tall, with the Cheyenne and Arapaho not far behind. The Dakota are notable for their aquiline noses and light complexion, the Cheyenne also being much lighter in color than their neighbors.

The Sioux, who call themselves *Dakota* or *Lakota*, "allies," number about 25,000 souls, being the largest tribe or confederacy in the United States. They formerly owned the greater portion of both Dakotas, with about one-half of Minnesota, and are now gathered on reservations within their ancient territory. Although well known linguistically and in the pioneer history of the west, they have yet to be studied from the ethnologic point of view. Their language was reduced to writing some sixty years ago and has now a considerable literature. Nearly all the men of the

tribe are able to conduct personal correspondence in their own language. They have a special fondness for parade, and eagle-feather war-bonnets are particularly numerous in this delegation. Among those in attendance were several men of prominence, but no generally recognized chiefs. Their tipis, some of which are tastefully decorated, were set up in a circle, following the old custom of the plains tribes. The Watópana, "paddlers," or Assiniboin, are an offshoot from the Yankton Dakota and speak their dialect. Their range was north of that of the Dakota, extending across the Canada boundary. They now number about 1400, gathered on two reservations in Montana, besides a small number in Canada. They brought with them a fine specimen of the old-style heraldic tipi.

The Crows (*Absárokĕ*), numbering now about 2100 on a reservation in Montana, occupied the Yellowstone country, west of their hereditary enemies, the Dakota. Although predatory in habit, they have never been at war with the whites, but on the contrary have usually furnished a contingent of scouts for the government service in the various Indian campaigns of that region. They have marked tribal characteristics, which would well repay study, as they are practically unknown to the ethnologist. The most prominent man of the delegation was White-swan, a former scout and the sole survivor of the Custer massacre in 1876, in which notable engagement he was shot and hacked almost to pieces and finally left for dead, but managed to save his life by covering himself with the blanket of a dead Dakota. With his hearing destroyed by blows of the tomahawk, his hands crippled by bullets, and his whole body covered with enduring scars, he is still able to tell the story in fluent sign language.

The *Sĭ'ksika*, or Blackfeet, known to ethnologists through the researches of Grinnell, are an important tribe numbering about 6000, in various subtribes and bands, formerly ranging over the whole country from the Yellowstone to the North Saskatchewan. Nineteen hundred of them are now gathered on a reservation in

Montana, the rest being in the adjacent Canadian province. Associated with them are two smaller tribes, the Arapaho Grosventres and the Sarsi. In physique the Blackfeet are among the finest men of the plains, tall and well built, with erect pose and steady countenance. Those in attendance at the congress belonged to the Piegán division, and brought with them an old-style ornamented skin tipi.

The Omaha, Ponka, and Oto, closely related Siouan tribes, numbering, respectively, 1170, 820, and 350, originally had their settlements along Missouri river in eastern Nebraska, under the protection of the powerful Pawnee, who claimed the whole Platte region. Occupying thus a subordinate position, they have never been prominent in tribal history, although in ethnology they are among the best known tribes of the west, owing to the extended researches of Dorsey, La Flesche, and Miss Fletcher. The *Omañ'hañ*, or Omaha, have given their name to the exposition city. The word signifies "up stream," as distinguished from cognate tribes formerly living farther down the river. They are also the originators of the picturesque Omaha dance, now common to most of the plains tribes. They reside on a reservation about sixty miles northward from Omaha and within the limits of their original country. Most of them now live in frame houses, but others still prefer their oldtime earth-lodge. Some of the Ponka also are on a reservation in northeastern Nebraska, but the majority, with the Oto, have been removed to Oklahoma.

The allied Cheyenne and Arapaho, who call themselves, respectively, *Dzĭtsĭ'stäs* and *Inû'na-ína*, both names being about equivalent to "our people," were represented by a large delegation from Oklahoma. Typical buffalo hunters of the plains, they yet have traditions of a time when they lived in the east and planted corn. The Cheyenne number in all nearly 3500, of whom 2000 (Southern) are on a reservation—now thrown open to settlement—in western Oklahoma, the remainder (Northern) being on a reservation in Montana, excepting a few living with

the Dakota or Sioux. Their tribal "medicine" is a bundle of sacred arrows in the keeping of one of the southern bands. They are a proud, warlike people, who have left a strong impress on the history of the plains. The Arapaho, numbering in all about 1800, are also in two divisions, the larger body living with the Cheyenne in Oklahoma, while the northern division resides with the Shoshoni on a reservation in Wyoming. The Grosventres of Montana, formerly associated with the Blackfeet and numbering now about 700, are a detached band of Arapaho. Unlike their allies, the Arapaho are of accommodating temper, disposed to pattern from our civilization, while the Cheyenne are strongly conservative. Their "medicine" is the "flat pipe," in the keeping of the northern division. As yet there has been no extended study of either of these interesting tribes, although some good linguistic work has been done among the Cheyenne by the Mennonite missionary, Petter. The two tribes are devoted to the ghost dance and are considered the most expert sign-talkers on the plains. (See plate VIII.)

From their reservation in western Montana came a delegation of Flatheads (*Sélĭsh*), the historic tribe of De Smet and Ravalli, accompanied by several Spokán (*Sĭ'nqomĕ'n*) and Cœur d'Alêne (*Kä'lispĕl*), the three tribes being closely associated and cognate, speaking nearly similar Salishan dialects and having the same dress and general appearance. Despite their name, the Flatheads do not, and never did, have flat heads. This paradoxical statement is explained by the fact that the Indians of the Columbia region, most of whom formerly compressed the head by artificial means, considered their heads thus treated as *pointed*, and contemptuously applied the term "flat-heads" to their neighbors in the mountains, who had not the custom, but allowed the skull to retain its natural shape. The early travelers adopted the name without understanding the reason of its application, and thus it came that the one tribe which despised the practice was supposed to be above all others addicted to it.

GROUP OF SOUTHERN ARAPAHO

Little-chief Hiding-woman Little-bear Hawk Little-bird
Bear-woman White-bull Freckle-face

The men wear their hair turned up from the forehead, somewhat after the manner of the Crows. Their color is not the coppery brown of the eastern Indians, but rather the creamy yellow sometimes seen among the Pueblos, which might be described as Mongolian were not that term so liable to misconstruction. In temper they are good-natured and fond of pleasantry, here again resembling the Pueblos rather than the sterner warriors of the plains. They formerly occupied the tangle of rough mountains at the extreme head of Missouri river, subsisting more by roots and berries than by hunting, as they were cut off from the buffalo country by their powerful enemies, the Blackfeet. They had houses of bark and reeds, as well as the skin tipi. In 1841 the heroic De Smet began among them that work which continues to be the most successful in the history of our Indian missions. In 1855 they were gathered on a reservation, where the confederated tribes now number about 2000, besides about 670 Spokán and 500 Cœur d'Alêne on the Colville reservation in Washington.

The *Hochû'nka-ra*, or Winnebago, formerly having their territory in southern Wisconsin about the lake that bears their name, were represented by a considerable delegation under a sub-chief, Black-hawk. They speak an archaic and strongly marked Siouan language, but had their alliances with the Algonquian tribes rather than with their own kindred to the westward. In dress and physical characteristics also they resemble the eastern Indians, wearing the turban, the beaded garter, and the short breechcloth, and having the compact heavy build of the agricultural tribes of the timber region. Living remote from the buffalo country, they subsisted principally on corn, wild rice, fish, and small game. Their houses, still in common occupancy on their reservation, are of the wigwam type, of woven rush mats upon a framework of poles, much resembling the wigwams of their former neighbors, the Sauk. Friendly, but conservative, they have a rare mass of ethnologic lore which yet remains to be studied.

They number now about 1150 on a reservation adjoining the Omaha in northeastern Nebraska.

The historic Sauk and Fox were well represented by a large delegation from Oklahoma and a smaller party from the band now living in Iowa. These two tribes, calling themselves respectively, *Ságiwûk* and *Mûskwákiûk*, names of somewhat doubtful interpretation, are practically one people, speaking closely related dialects of one language and having been confederated from a very early period. They were prominent in every Indian movement of the lake and upper Mississippi region from the beginning of the French and Indian war until their power was broken by the result of the Black-hawk war in 1832. Their territory lay on both sides of the Mississippi, in Iowa and northern Illinois, having the cognate Potawatomi and Kickapoo on the east, the Winnebago and Dakota on the north, and the Iowa on the west. With all of these, excepting the Dakota, they maintained a friendly alliance. Keokuk, in Iowa, derives its name from a noted friendly chief of the Black-hawk war, and Anamosa in the same state commemorates an heroic mother of the tribe who swam the Mississippi with her infant tied upon her back to escape a massacre in which nearly two hundred men, women, and children of the Sauk fell by the bullets of 1600 American troops. The younger daughter of Anamosa accompanied the delegation.

The Sauk have always been agricultural, and they wear the turban and characteristic moccasin of the eastern tribes. Their beaded work is especially beautiful, and like the Winnebago they weave fine mats of rushes with which they cover the framework and carpet the floors of their long, round-top wigwams. They brought with them sufficient of these mats to set up several wigwams, which are entirely different in shape and structure from the conical tipi of the plains tribes. In person they are tall and strongly built, with faces indicating thoughtful character and firm will. With proud conservatism they hold fast their forms, legends, and complex social organization, and are today probably the

most interesting study tribes of the whole existing Algonquian stock. They have a syllabic alphabet, apparently the work of some early French missionary, by means of which they keep up a correspondence with friends on their various scattered reservations. The same vehicle could doubtless be used in recording their songs and rituals. The two tribes now number together about 970, of whom 500 are in Oklahoma, nearly 400 in Iowa, and a small band in Kansas. Some work has recently been done by Prof. W J McGee in the Iowa band, which is composed chiefly of *Mâskwaki*, or Foxes.

With the Sauk there came also several of the cognate Potawatomi (*Potewâtmik*), and four Iowa (*Páhoché*), the latter being a small Siouan tribe, now reduced to 260, formerly living, in alliance with the Sauk, in central Iowa, which derives its name from them.

The Pueblos were represented by a delegation of about twenty men from Santa Clara pueblo on the upper Rio Grande in New Mexico. As is well known, the Pueblos constitute one of our most distinct and interesting native types, but owing to the fact that the agent who made up the delegation was instructed to send only men, it was impossible to make any showing of such characteristic industries as bread making, pottery making, or basket weaving. As Santa Clara is one of the smallest of the pueblos, and only a short distance from the railroad and the town of Española, its inhabitants have been so modified by contact with white civilization that they have almost forgotten their aboriginal arts and ceremonies. Being unable to carry on any of their native industries or to participate in the ceremonials of the other tribes, the Santa Clara men confined their effort chiefly to disposing of some cheap pottery of the sort made for sale to tourists at railway stations.

The 26 existing Pueblo towns of New Mexico and Arizona, with some transplanted settlements near El Paso, Texas, have altogether a population of about 11,000 souls, representing, according to our present knowledge, four different linguistic stocks.

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Three pueblos have more than one thousand souls each, while Santa Clara has but 225. The type is too well known, from the researches of trained investigators, to need any extended notice here. The Santa Clara Indians belong to the Tanoan stock. They call themselves *Owĭ'ně*, and their village *Ka'pa*, a name which seems to contain the root *pa*, water. They are aware of their relationship to the people of the Tusayan village of Hano, which some of their old men have visited. Nearly all have Spanish names in addition to their proper Indian names. They elect a governor, or chief, every year. Their present governor, Diego Naranjo, with the last ex-governor, old José de Jesus Naranjo, accompanied the party, the former bearing as his staff of office an inscribed silver-headed cane presented to the pueblo by President Lincoln in 1863.

A small but notable delegation was that of the Tonkawa, who call themselves *Tĭ'chkan-wátich*, "indigenous people," a title arrogated by half the insignificant little tribes known to ethnology. Although the mere remnant of a people on the verge of extinction, the Tonkawa are of peculiar interest from the fact that, so far as present knowledge goes, they constitute a distinct linguistic stock, and are the only existing cannibal tribe of the United States, while historically they are the sole representatives of the Indians of the old Alamo mission, whose most tragic incident had its parallel in the massacre that practically wiped out their tribe.

Living originally in southern Texas, the Tonkawa experienced all the vicissitudes that come to a vagrant and outcast people until they were finally gathered, in 1859, on what is now the Kiowa reservation, having their village on the south bank of the Washita, just above the present Anadarko. The other tribes, which hated them for their cannibal habit and for the assistance which they had given the troops in various border campaigns, took advantage of the confusion resulting from the outbreak of the rebellion to settle old scores, and joining forces against the Tonkawa,

surprised their camp by a night attack on October 23, 1862, and massacred nearly half the tribe. Since then their decline has been rapid, until there are now but 53 left alive, on lands allotted to them in eastern Oklahoma. Some excellent studies have been made among them by Gatschet, who determined their linguistic isolation. Their chief, Séntelĕ, alias Grant Richards, a former government scout, accompanied the party.

The celebrated tribe of Apache, who call themselves *Ndĕ*, "men," was represented by two delegations, numbering together about forty persons, viz: some White Mountain Apache from San Carlos reservation in Arizona, and some Chiricahua from Fort Sill, Oklahoma, where they are now held under military restraint. With the former there were also some Mohave, a distinct tribe of Yuman stock.

From their connection with the border wars of the southwest, and through the researches of the late Captain Bourke, the Apache are so well known as to require no extended notice here. A part of the great Athapascan stock, they have fought their way through hostile tribes from Yukon river to the Rio Grande, finally establishing themselves in the mountain region of southern Arizona and New Mexico, whence they made unceasing forays in all directions until their name became the synonym of all that was savage and untamable. From the nature of the country in which they lived, and their inherited capacity for enduring hardship, they proved the most dangerous foes against whom our troops were ever forced to contend. Since their final subjugation a few years ago they have tried to adapt themselves to the situation, and evince a native intelligence and solidity of character that bid fair to place them in the front rank of self-supporting tribes. It will be remembered that they are first cousins of the Navaho, the most successful stock raisers and most expert weavers in the United States. They number nearly 5000, all now on San Carlos reservation in Arizona, excepting the Chiricahua band of about 300, held as prisoners of war at Fort Sill. They have no central

organization, but are subdivided into a number of bands, each under its own chief.

The White Mountain delegation was under command of the hereditary chief, Go-zhazh, "Jingling," known to the whites as Josh, of pleasing features and manly air (plate IX). They wore the dress of their tribe, with flowing hair, red turban, close-fitting buckskin legging, and characteristic turned-up moccasin. The women have their hair cut across the forehead. Nearly all the men had tattooed upon their foreheads figures resembling the rain and cloud symbol of the Hopi. The Mohave had the same dress and general appearance. They brought with them their native baskets and dance costumes and set up their round-top canvas wikiups after the style of those on the reservation.

The Chiricahua, the last Apache band to go on the warpath, were finally run down and compelled to surrender to General Miles in 1886. As the people of Arizona protested against allowing them to remain longer in that territory, they were deported bodily to Fort Marion, Florida, thence after some time to Mount Vernon barracks in Alabama, and at last to Fort Sill, on the Kiowa reservation, Oklahoma, where under a few years of good management they have developed from miserable savage refugees to prosperous farmers and stock raisers, quite a number being enrolled and uniformed as United States scouts. The delegation was a picked one, and included Naichi, "Meddler," the hereditary chief of the band, a man of soldierly air and figure; Geronimo, the old war captain, a natural leader of warriors, but withal a most mercenary character, with one or two foot-racers and experts in native arts, and several women, with two infants in cradles. Being under military control, they were housed in army tents. The exiles devoted their time to good advantage, making baskets, canes, and beaded work for sale, and found much pleasure in meeting their old friends from Arizona and exchanging reminiscences.

Some tribal ceremonies were arranged, but were discontinued owing to an evident purpose to reduce everything to the level of

SAN CARLOS APACHE

Jesus Chief Josh

XUM

a "Midway" performance. Among those given were the noted ghost dance of the plains tribes, the mounted horn dance of the Wichita, and the unique and interesting war dance and devil dance of the Apache, the last being performed at night by the light of a fire, with a clown and other masked characters, after the manner of the Hopi or Moki dances. There were also foot-races by picked runners from several tribes.

The Kiowa camp circle—a series of miniature heraldic tipis in buckskin, with the central medicine lodge and all the necessary shields, tripods, and other equipments to make it complete—was brought from Washington and set up within a canvas corral of eighty feet diameter. This presentation of the old camp circle of the plains tribes is a complete reproduction, on a small scale, of the last great sun-dance camp of the Kiowa Indians, just previous to their signing of the historic treaty of Medicine Lodge in 1867, by which they gave up their free life and agreed to be assigned to a reservation. It is the property of the National Museum, and was prepared on the reservation under direction of the Bureau of American Ethnology, every miniature tipi and shield having been made by the hereditary Indian owner of the original.

Under an arrangement between the exposition management and the Bureau of American Ethnology a special fund was appropriated for securing portraits of the Indian delegates. The work was done by the exposition photographer, under the supervision of a member of the Bureau, according to a systematic plan, the Indians being photographed in costume in tribal groups and singly, in bust, profile, and full length, resulting in a series of several hundred pictures forming altogether one of the finest collections of Indian portraits in existence. The negatives are now in possession of the Bureau. At the same time the Indian name of each individual was obtained, with its interpretation, and some points of information concerning the tribe, with brief vocabularies of each language, from which is selected the following short list of words for comparison:

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COMPARISON OF LANGUAGES REPRESENTED AT THE INDIAN CONGRESS

ALGONQUIAN STOCK

	Arapaho	*Cheyenne*	*Blackfoot* (Tims)	*Sauk*	*Potawatomi*
Proper tribal name	Inû′na-i′na	Dzĭtsĭ′stäs	Sĭ′ksika	Sa′giwŭk	Potewa′tmik
Man	hinĕ′n	hitä′n	nĭ′nnau	hĭnĕ′nuw'	nĕ′nĕ
Woman	hĭ′si′	he′ĕ	ake′	ĭ‘kwä′w'	kwä
One	chäsaiy'	nok	nitu′kskŭm, (seă)	nĕkŭt	got
Two	nish	niq	na′tokŭm	nish	nish
Three	näsăq	nă′hĕ	nio′kskŭm	nĕswĕ	swĕ
Four	yen	niv	nĭssoyi′m	nyĕw'	ni′ĕw'
Five	yathûn	no′honä	nĭsitto′	nya′-lûnw'	nya′nûn
Six	ni′ta′tăq	nasû′qtohä	nau′	ne′kûtwa′sĭk	gotwa′tso
Seven	nisa′tăq	ni′sûqtohä	ikĭ′tsika	nuhĭk	no′ûk
Eight	näsa′tăq	nanûqtohä	na′nĭsso	nĕswa′sĭk	shwatsă
Nine	thi′atăq	so′qtohä	pi′kso	sha′kă	shak
Ten	bä′tätăq	mätû′qtohä	ke′po	mĕta′thwă	datsă

	ATHAPASCAN STOCK			TANOAN STOCK	YUMAN STOCK.
	Apache (*San Carlos*)	*Kiowa Apache* (Gatschet)	*Lipán*	*Santa Clara Pueblo*	*Mohave* (Corbusier)
Proper tribal name	Ndĕ	Nadi′-ishañ-Di′na	Na′-izhă′ñ	Owĭ′nĕ	Hamok-a′vi
Man	ndĕ	tena	ĭndĕ′	sĕñ	pipa
Woman	ĭstsû′n	tche-tcha	jĕkĕ′	kwi	thinyak
One	da‘la′	‘la′-ae	da‘lĕĕ′	wi	se′to
Two	nakĭ′	nda′tchi	na′kĭ′	wija	havi′ka
Three	ta′gi	kagi	kagĭ	poyĕ	hamo′ka
Four	di′ĭ	te′intchi	di′ñjĕ	yonû	tchimpa′pa
Five	ash‘lai′	ă′sslla	ăstlă′	panû	thara′pa
Six	gustă′n	guska	goska′	sĭ′	si-i′nta
Seven	gustsĭ′gi	gustchĭ′t	gos-chĭ′t	tsĕ	vi′ka
Eight	tsĕ′pi′	shapĭ	zhañpĭ′	qa′vi	moka
Nine	ngûstai′	niguste″	nastĕ′	hwäno	pa′ya (hailyuthu)
Ten	gunĕznû′n	gude′snoñ	kwĭ′nĕs′nă (-nĭ	dă′	ara′p'havik

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	CADDOAN STOCK		TONKAWAN STOCK	SALISHAN STOCK
	Wichita	*Kichai*	*Tonkawa*	*Flathead* (Mengarini)
Proper tribal name	Kɪ′tikɪ̆ti′sh	Kitsa′sh	Tɪ′chkan-wa′tich	Se′lĭsh
Man	wets	wi′tă′	a′ako′n	skaltmi′gu
Woman	gahe′k	tsăkwa′k	epai′-aqo′tan	s'mèm
One	tsi′ûs	û′rĭsk	wĭshpûq	nko
Two	wĭts	tsusu	ketai′	esèl
Three	daw'	da′wĕ'ko	metɪ′sh	chèlès
Four	da′kwĭts	gĭnû′kt	shekĕ′t	mús
Five	ĭskwe′ts	iksdo′io′q	gashkwa′	zíl
Six	ge′hăs	nahita′w'	shĭkwa′la	tàckan
Seven	ge′ăhwĭts	tsa′watût	shĭki′ĕshtă′	síspel
Eight	ge′ăta′w'	na′hĭginû′kt	shĭkiti′sh	hèhènem
Nine	chûskɪ′nde′	da′neroga′t	shĭkwĭsqwa′la	ganút
Ten	ĭskɪ′riăwa′ash	ĭks-kyän	sĕkpa′q	open

SIOUAN STOCK

	Dakota (Green)	*Assiniboin*	*Oto*	*Omaha*	*Winnebago* (Riggs)	*Crow* (Hayden)
Proper tribal name	Lako′ta (Dakota, Nago′ta)	Wato′pană	Wato′qtata	Omañ′hañ	Hochû′nka (-ra	Aub-sa′ro-ke
Man	wicha′sa	wichă′	wañgi	nu	wang-ra	batse′ (watsi′)
Woman	wiñyañ	wiña	hina′gi	wao′	hinun′g-ra	mi′e
One	wañzhi′la	wancha	yûnk	wi′a'tsi′	jankida	hama't
Two	noñpa	nopa	no′ñwe	nûmba	nampiwi	nop
Three	yă′mini	yă′mini	da′nyi	la′bă-dhi	tani	nam
Four	topa	dopa	dowi	do'ba	copi	shop
Five	zapte	zapa	tha′tûñ	satû	sats	tsihoq
Six	sa′kopi	shakpe	sha′gwĕ	sha′pe	ake′we	aka′mak
Seven	sako	shago′ă	sha′ma′ñ	pe′ûmba	shakowin	ha′pua
Eight	sa′kolo′ga	shak-ndo′-gha	grera′bări	pe-dha′ba-dhi	hadunwank	no′pape
Nine	nupshi-u′nka	napcho′ûnk	ksankĕ	shanka	hijanki-conskoni	ama′tape
Ten	wiksha′mini	wikche′bna	gre′bră	gdheba	kedepanajan	pi′raka′

KOREAN CLAN ORGANIZATION

By WALTER HOUGH

The following information concerning the Korean family or survival of the clan was elicited during several conversations with an intelligent Korean, Mr Kiu Beung Surh, who is receiving his education in the United States. The strength of a clan organization in an ancient country like Korea, which has long possessed a general scheme of government, is interesting.

Clan Head and Council Delegates.—The head of the clan (family) is the direct male descendant of the ancestor by primogeniture. The government of the clan is by the head (*chong son*, "direct descendant") and a council elected by groups of the family in various parts of the country. The head of each family group becomes such by nearness to the line of descent, by age, or ability.

The delegates to the clan council, which is held usually in Seoul, are elected by ballot, viva voce, or by appointment by the local head. Only one delegate is sent from each village, and his expenses are borne by the group. Others may go, however, if they defray their own expenses. In case no delegate is sent, the head imposes a fine. The head also levies a tax or assessment on the members of the clan. This tax is not uniform, but is fixed in accordance with the means of the individual. The money collected is paid to the keeper of the central clan meeting-house (*ta tchong ka*, "great family house," the word *tchong* meaning blood relationship or brother). The tax is applied by the keeper, under direction of the council, toward keeping up the ancestral tombs, shrines, and sacrifices, to investment in land, etc., and to the maintenance of such land and the clan house.

The revenues of the clan lands are also applied to meet expenses. The keeper usually farms the clan lands, and his services are therefore remunerated.

Meeting-place of the Council.—The clan house may be situated in any part of the country, but usually it is located at the capital. The care of the house devolves on the keeper, who is not necessarily a member of the clan.

Business of the Council.—Meetings are called on many matters connected with the interests of the clan, such as the death of a prominent member, congratulations on the advancement of members of the clan, questions relating to burial grounds over which disputes may arise, or for the expulsion of members from the clan, etc.

Burial Grounds.—It should be explained that the clan cemetery is located at one place, to which the remains of all deceased members are taken for interment. The tombs of the ancestors are kept in repair by the clan, each existing family unit caring for the graves of its own immediate dead. In case of the decline or extinction of a family, the clan provides for the care of the tombs. The selection of a cemetery in Korea is a complicated proceeding, and is the result of a great deal of research by an "earth doctor," who chooses a place free from evil influences (*feng shui* of the Chinese) by means of geomancy. This earth doctor is an important personage, as he is supposed to be familiar with the place-spirits and earth-spirits, which among primitive peoples are believed to vivify inanimate matter. The graveyards are located usually in the mountains, and they form one of the chief obstacles to mining or railroad enterprises, so great is their number and extent.

If a clan should wish to buy a portion of the unoccupied burial ground of another clan and be refused, secret burials are sometimes made on such land. The removal of these intrusive remains has often led to friction between the clans, for interments of this kind are believed to affect the fecundity of the clan.

XUM

It is said that when a marriage is not fruitful the matter is brought before the council and inquiry is made, especially if the complainants are wealthy, as to whether the ground is inviolate.

A few Buddhists burn their dead. The usual Korean method is to bury at full length, in the customary clothes, and to wrap the body in coarse hemp cloth before placing it in a coffin. Often the dead are required to be carried long distances to the clan graveyard. Over the grave a mound of earth is heaped up, and this is soon covered with short, velvety grass.

Laws of the Clan.—The prohibition of marriages between members of the same clan name, which seems to be a world-wide custom, is a prominent feature of Korean sociology. It is more than a law with penalty for infraction; it is a traditional custom of which the negative is inconceivable. The civil law against remarriage by a widow is said to have originated in the necessity of prohibiting the doing away of one husband with the view of taking another. The marriage of a deceased wife's sister is no more to be thought of in Korea than is marriage within the clan.

Offences and Penalties.—The clan laws take cognizance of three or more offences against the clan and prescribe the punishment therefor. If a member becomes a traitor against his country he is expelled from the clan and thereafter forbidden to use the clan surname. This penalty is more severe than may appear at a glance, because it amounts to excommunication from the ancestors, and ancestral worship is the central idea of the clan. Another offence is illicit intercourse between families, which strikes at the root of the clan marriage system. This offence may be punished within the clan, but if it becomes known the civil authorities take cognizance of it. The clan penalty is excommunication.

The third major offence is disrespect to parents or to old people. This infraction is usually corrected by the clan, but when the offence is glaring or repeated, it is punished by civil law.

Support of Poor Members.—In countries like China and Korea where filial piety and respect for the aged are inculcated (this, however, apparently within the clan), the support of poor members of the clan does not often require attention. The support and succor of indigent or unfortunate members by the clan seem not to be obligatory, nor do they appear to be a part of the system of coöperation, but are effected through charity. No doubt the claims of relationship are strong enough to be the moving factor in all such cases.

Adoption.—Korean families are prevented from becoming extinct by the custom of adoption. The rule followed is that a child of a younger generation is selected and one not in the line of descent; that is, the second male child may be adopted. The adoption of female children is rare.

Thus, perhaps, the claims of great antiquity made by some clans may not be out of reason, as that of the Kim and Ye clans of Wo Sing in Ping Yang, whose descent is said to be traceable through a period extending over four thousand years. Curiously, also, the Korean clans still live in the definite localities where they originated.

Political Parties.—The political parties which divide Korea and which at present are those of the North, South, East, and West, involve the clans on account of the localization of the latter. Clans, however, are often divided in political opinions, but this exerts no influence on their organization as a consanguineal group.

The following list of family names comprises the most important in Korea. While some of the names are taken from natural objects, no totemic devices survive according to my informant. As is customary in business, however, the clans have seals, or rather the head of the family uses his seal by virtue of descent. As is the case with the family names, none of the seals bear totemic devices.

XUM

KOREAN FAMILY NAMES

SANG YUK SEUNG OR "SIX HIGH FAMILY NAMES"

1. Ye.....Plum
2. Kim.....Gold
3. Chai.....Precipitous
4. Ahn.....Peace
5. Cheung.....Ancient nation
6. Pak.....Dwarf nettle (*Cectis sinensis*)

HA YUK SEUNG OR "SIX LOW FAMILY NAMES"

1. Ta.....Great
2. Pi.....Hide or skin
3. Pang.....Name of a feudal state
4. Chu.....Autumn
5. Cha.....Cart or wheeled vehicle
6. Reum.....Humble and wise

OTHER FAMILY NAMES

Surh or Söh. Slow
Peun.....Frontier
Meung.....Bright
Wang.....King
Ye.....Pear tree
Mun.....Literary
Chun.....Heaven
Chun.....Thousand
Yong.....Dragon
Poung....."Son of the Heavenly bird"
No.....Mule
Ho.....Door
Chung.....One of the ten stems
Heun.....Black
Go.....High or lofty
Hor.....Promise or permit
Kang.....The name of an emperor (B.C. 2838), Sin Nong, the inventor of agriculture
Min.....Mourn or grieve
Yu.....Willow tree
Yu.....The name of an ancient principality
Păk.....White
Hŏng.....A flood, overflowing
Um.....Prince-like
Kwun.....Power
Cho.....An ancient nation
Wu.....An ancient nation
Wu.....A thong of leather
Oh.....Name of ancient nation
Sök.....Ancient
Sok.....Stone
Wan.....Chief
Wan.....A long robe
Ur.....Fish
Ha.....Milky-way
Song.....Name of a dynasty
Ruk.....Dry land in contrast to water
Yeur.....A musical pipe
Poong.....Water sprout
Mya.....A sorceress
Ma.....A horse. A knight in Korean chess
Goo.....Implements
Ham.....All, entire
Han.....An ancient nation
Rim.....Forest
Charng.....Publish
Pum.....Plant, grass
Pai.....Long robe
Parn.....Rice water
Parng.....Square
Peun.....Rule
Sung.....Finished or complete
Sim.....A name of a state
Sin.....Messenger
Sin.....Acid or bitter
Cheun.....Perfect
Nam.....South
Quak.....An outer fortification
Gun.....To direct
Woo.....A name for King U who lived 2200 B.C.
Nam-Koong..South palace
Neuk.....A surname
Ro.....Name of a wild tribe
Gin.....To marshal

"REAL," "TRUE," OR "GENUINE," IN INDIAN LANGUAGES

By ALBERT S. GATSCHET

When we desire to convey the impression that such a man is a typical Frenchman in body and mind, in manners and language, that is, an embodiment of all that is French, we mean that he is a *true* son of his country. There is nothing uncommon in this, no more than there is in the fact that the continental Greeks once called the inhabitants of eastern Crete the *Eteocretes*, or true, genuine Cretans, which meant that they had remained free from admixture with the Carian or with any other race. The same idea is expressed by the Germans when they call the Czechian, or Slavic-speaking population of Bohemia, *Stockböhmen*, for these, who form three-fifths of all Bohemians, are thereby regarded as belonging to the old and original stock of the population. The designation, however, sounds like a nickname, through its intimate analogy with terms like *stockblind*, *stocken*, *stockig*, *Stocknarr*. In the same way the application of the term "Hibernian" to a typical Irishman would sometimes be regarded as banter.

Similar designations have been found to a considerable extent in the languages of more primitive peoples, referring to persons and other animate beings as well as to inanimate objects, which bear nothing of the jocose or bantering in themselves, but are applied seriously. Some of the terms are so quaint, curious, idiomatic, and attractive, that I resolved to collect a number and subject them to careful study, regarding them as true and palpable products of the aboriginal mind.

The terms for "true" or "genuine" in most of the idioms to be mentioned are simultaneously adjectives and adverbs, and,

curiously enough, with a slight change in pronunciation or suffixion they also mean "man" and "Indian."

ALGONQUIAN

The Algonquian languages, which are among the most thoroughly studied of all the North American tongues, yield many curious instances of the intention of the natives to convey the equivalent of "genuine." The two words chiefly used by them in this sense are *lénia* or *léni*, and *inína;* both are etymologically identical, with the phonetic change from *l* to *n*, and both stand for "man" and for "genuine" with their various synonyms.

Peoria, Miami.—Among the Indians formerly settled in Illinois and Indiana, *léni, läni*, is the word for "real," "genuine," and *lä'nia* for "man," "male," and "Indian." But the Shawnee, whose ancient home was farther eastward from Mississippi river, use *hiléni* for all the above terms. In Peoria and Miami *läni kŭ'sia* is "muskrat," i.e., "the real mouse" or "the genuine rat"; *léni mahuéwa*, "prairie-wolf," literally, "the genuine wolf," or, more accurately, "the genuine jacal." *Lenapízha* or *Länapízhia* is a mythologic name sometimes applied to persons and totemic clans. It is interpreted "whale," "monster," "water-monster," and designates any large animal. The Lenapizha is said to live in the water and to become visible only when lightning strikes a lake or river. A literal rendering of the name is "the real tiger," for *pízhi* is identical with the Ojibwe *bishiw, pīzhiu*, "wildcat," "tiger," "tiger-cat," and would apply also to the cougar of Central America and South America. The term for "right," as opposite to "left," also contains *léni;* the Miami say *länadshónshi aneki*, "right hand." The form *inína* is represented in Peoria, Miami, and other dialects also, but not as a substantive; it is the demonstrative pronoun "that one," "that," referring to distance (*hine* in Shawnee), whereas *unína* is "this one," "this here," close to the speaker.

Shawnee.—The Sháwanoa or Shawnee dialect of Algonquian

employs *hiléni* (abbreviated *léni*) for "real," "genuine," and the same term is in use for "man" and "Indian." *Hilen-akuí* or *hilen'-áku* signifies "bow," "war bow," anciently made of iron-wood and hickory; this compound means "real wood," for in Shawnee "bow" and "wood" are expressed by the same generic noun, *áku*, inseparable from the noun that qualifies it. In the same manner the heavy arrow or war arrow was named *hilen' alwí*, abbreviated *len' alwí*, *lenalúi*, literally "genuine or true arrow," to distinguish it from the hunting arrow, bird arrow, or toy arrow. The "red man's tobacco" the Shawnee call *hiléni lthä'ma* or *hiléni ilathä'ma;* it is a mixture of badger willow bark with the leaves of *Uva ursi*, etc., and, as "genuine," must be kept distinct from the white man's tobacco. The Indian or "true" pumpkin, *hiléni wapikwí'*, was a plant of miraculous origin, for it was supposed to grow only where lightning had penetrated the earth.

Delaware.—Of the Delaware dialects the Unámi or Wonámi is accessible to us through two copious but not quite satisfactory dictionaries, from which we learn that *lenno* (plural *lennowak*) is "man," "male," "Indian," and *lenni*, "genuine," "pure," "real," "original." *Lenápe*, *Lenápi*, is an Indian of pure race, and *lénni Lenápe*, as an augmentative of the above, is the "Indian of pure descent," unaltered from his ancestors in blood or body, in sentiment or customs.[1] The Delawares applied this name formerly to themselves, for the people of every tribe believe themselves to be superior to every other. Their neighbors, the Shawnee, now call them *Lenapégi*. A certain species of fish, the "chop fish," is called *lenn-ámek*, "true fish," in the Unámi dialect; and *lennahawanink* means "at the right hand," "to the right."

Nipissing.—In the Nipissing dialect of Ojibwe, spoken on upper Ottawa river and at Oka, or the mission of the Lake of Two Mountains, there are quite a number of instances which

[1] The term *-ape*, *-api*, "standing," "erect," is an inseparable suffixed noun which occurs in all eastern Algonquian languages with the signification of "person," "man," "Indian."

illustrate the idea of "genuine." *Iníni* is "man," "Indian" (plural *ininiwak*); but *inin* is "true," "natural," "genuine," or "par excellence." From the Abbé Cuoq's copious *Dictionnaire de la Langue Algonquine* the following are gleaned: *Inini kóman*, "hunting knife," carried in a sheath or scabbard, lit. "real metal"; *ininipato*, "(this horse) is a good, 'genuine' trotter"; *inin andak*, "pine tree," "real tree," lit. "tree of evergreen branches"; *inin ashkwáyi*, "bark from which to make canoes," lit. "true bark"; *inin ásin*, "flint," "silex," lit. "real stone," "live stone"; *inin átik* (*a* short), "cariboo," lit. "true or real beef or cow," *átik* including any species of the bovine family; *inin ātik* (*ā* long), "maple," lit. "the true tree," called also the national tree of Canada (*ātik* refers only to deciduous trees); *inin mítik*, "hard wood," as oak, etc. (in Canadian French, *bois franc*, as distinct from *bois mou*); *inin Wemitigōshi*, "a Frenchman of France."

Cree.—In the dialect of the western Cree or Kinisteno the terms *inini* and *inin* appear with slight consonantal change, as *iyini'w*, "man," and *iyinato*, "true," "real," "principal." Père Lacombe, who has studied this dialect carefully and published the results in his *Dictionnaire et Grammaire de la Langue des Cris* (Montreal, 1874), gives instances of their use, from which we gather that the Cree Indians call themselves *Iyiniwok* (from the radix *iyin*, "pure" and "first"), not because they believe themselves to be the first of men, but because they regard themselves to be still in a natural state. Whether or not this is the correct explanation of the term, it is certain that *iyinato* (abbreviated *n'tôk*), which is adjective and adverb simultaneously, corresponds closely to *léni* and to the Iroquois *ónwe* below, and means "true," "real," and "truly," "really"; *iyenato iyiniw*, "a genuine Indian"; *iyenato ayamihâwin*, "the true religion"; *n'tôk kissin anotch*, "it is really cold today"; *iyinato naspitâtuwok*, "they resemble one another extremely well"; *iyenato Wemistikosiw*, "a Frenchman from France," "a true Frenchman"; *iyenato pimâttsiwin*, "the true life"; *iyenato sominabüiy*, "unadulterated or unmixed wine."

Arapaho.—Of the western Algonquian dialects in the United States, that of the Arápohu or Arapaho yields a few instances of the linguistic feature occupying our attention. Here the term for "man," "male," *ínen, hinén* (plural *inén'na*), differs from that of "genuine," which is expressed by *äthine;* e.g., the red flinty maize is the "true corn" (*äthine beshkatä*) for making hominy. *Ahät,* "cottonwood tree," a species of poplar, is also called *athina,* or the "true tree." In the arid region the cottonwood is frequently the only tree to be found, hence *ahät* came to mean also tree in general. *Häthina tö-ukthethi* is "sheriff," lit. "true or real policeman," the latter vocable meaning properly "person tier." Some western tribes designate the bison by a term signifying "real bull or beef." The term for "man" has probably named also the Arapaho tribe, for *hinána* or *innána inén* is "an Arapaho man"; *innána issē,* "an Arapaho woman."

IROQUOIAN

Mohawk.—The language of the Iroquois of New York comprises six dialects: one of these, the Mohawk, was transferred to Canada and is now spoken at Brantford on Thames river, Ontario, and at Caughnawaga on the St Lawrence, in Quebec. In Mohawk the term *ónwe,* "true," corresponds to the *léni* and *inin* of Algonquian dialects, but it also includes permanence, stability, perpetuity, immutability, and is used adverbially as well. Thus we have *ónkwe ónwe,* "true man," which signifies "Indian" as well as "Iroquois Indian"; *ohasera ónwe,* "common candle," as distinguished from *ohaserato kénti,* "ceremonial or church candle"; *kanatarok ónwe,* "true bread," i.e., that made by Indians; *Onserónni ónwe,* "Frenchman proper," "native of France"; *Tíorhensáka ónwe,* "native Englishman."

KIOWAN

Kiowa.—These Indians do not use a special word to express "real," "principal," or "true," but they append a suffix, *-hi* (nasalized *hiⁿ*), for the purpose, according to Mr Mooney. For

example, *tse*^{n}, animal, horse; *tse*^{n}*hi*, dog; *gŭăto*, bird; *guătóhi*, eagle; *säne*, snake; *sänehi*, rattlesnake; *ä-*, tree (*äto* usual form); *ähi*^{n}, cottonwood tree.

SHOSHONEAN

Comanche.—The term *tibitsi* appears to fulfil this function in the Comanche language; it means "true" and "very"; *tibitsi nem* is the "genuine nation," meaning the Comanche themselves, who call all nations differing from them *átawitch*. *Tibitsi bür* (or *per*) signifies the right or real arm; *óhini bür*, the left arm.

TONKAWAN

Tonkawe.—The Tonkawe or Tonkawa tribe of Texas, whose ancient habitat is difficult to determine on account of their former migratory habits, call themselves *Titchkan-wátitch*, "indigenous people." *Atak* in their language corresponds to the Algonquian *léni* and *inini*, and is used adjectively and adverbially. One of the eight Tonkawa clans is called *Titskan-wátitch átak*, "real Tonkawas," anciently so called; *ekwánshχo átak*, or "real horse," is a gelding, because these were regarded as the best horses for use in battle; *niswálan átak* is "catfish," a species of which, found in Clear fork of the Brazos, is said to reach a length of five feet and to weigh eighty pounds. *Sénan átak* is "milk-snake," and is called "real," "true," on account of its brilliant coloring; hence also its other name, *sénan taχáshe*, "sun-snake." *Tchúχa* or *tchúχa átak* is the name of the common field-mouse, but another and rarer species is called *tchuχ esaú* or "bogus mouse." Adverbially the term appears in such phrases as *ákun átak*, "positively, surely a man"; *wúsh atak*, "just now"; *téna-i átak*, "long ago." Right and left are expressed in another way: *yákwan hé-i*, the right leg, is the "strong leg"; *yákwan wáse-i*, left leg, is literally the "leg on the other side."

NORTHWESTERN COAST LANGUAGES

Selish—Kwakiutl.—Concerning the languages of the Pacific states and territories I have received a few indications from Dr

Franz Boas, who has made a special study of the coast dialects. According to these, the Selish dialect of the Nlakyapamuχ, in British Columbia, expresses the idea of real or genuine by the suffix *-o^{n}e*, and the Kwakiutl of British Columbia by *-kyas*. These terms show no affinity, however, with the word for "man" or "Indian" in the dialects to which they belong,

Chimmesyan.—Of this language, the Nisχa dialect has *sĕm* for "real," "true," and "really," "truly." Examples of its use are *sĕmgig a't*, "real men," i. e., the nobility; *sĕmhala-i't*, "real shaman or conjurer"; *sĕm hézuk*, "early morning"; *sĕm-g'a'-a*, "to look thoroughly." The prefix *alō-*, when followed by a word in the reduplicated form, means "alone," "by oneself," "by itself"; thus, *alōg'ig'a't*, "Indian," is literally "alone man."

Investigation of the languages of Mexico, Central America, and South America has yielded but few terms that can safely be regarded as parallels with the above.

Perhaps the most interesting result to be derived from what has been recorded is the close affinity between the terms for "genuine" and those for "man." There can be hardly any doubt that "man" or "male" is the primary word or concept, for concrete nouns always precede terms which express abstract ideas; therefore, the idea of "man," "human being," individualized to "man of our own tribe," must have been the prototype of the terms for "real" or "genuine."

The subject-matter of this paper gives rise to many similar problems to be solved by the comparison of terms of subtle meaning in various languages. Among these occur the questions why European languages are so fertile in augmentative forms, while native American dialects are so deficient in them; why inseparable generic nouns are much more frequent in American than in Aryan compounds; and why certain classifiers, figuring especially as suffixes to adjectives, occur so frequently, especially in the numerals, in the languages of the western continent.

XUM

THE ADOPTED ALGONQUIAN TERM "POQUOSIN"[1]

By WILLIAM WALLACE TOOKER

Among our numerous adopted Indian words the subject of this essay survives in local parlance in some parts of the Carolinas, Virginia, and Maryland, as a topographical term for low lands or marshes. Its lexicographical variations are *pocoson*, Worcester (1846); *pocoson*, or *poquoson*, Bartlett (1859); *pocosan*, De Vere (1872); *pocosin*, in the Century Dictionary, and *pocoson* and *poquoson*, in the Standard Dictionary. As it is surely time for lexicographers to agree on some standard spelling, we have selected '*poquosin*'—a form more generally prevailing in print and representing more clearly the original phraseology—as the proper spelling.

These swamps, wrote the late Prof. J. D. Whitney,[2] "are locally known as '*dismals*,' and also as '*pocosins*,' the latter word being apparently an aboriginal name, and, if so, one of the very few instances (if not the only one) in which a word of this kind has become—to a limited extent, it is true—generalized as a topographical designation."

Mr W. G. Stanard, who has devoted much study to the land patents and other records of Virginia, writes[3]: "*Poquoson* is an Indian word meaning marsh or low ground. There is frequent mention in the patents of land being bounded by, or being in part a '*poquoson*.' Not long ago a North Carolina paper referred to the '*poquoson* lands' on the Roanoke."

[1] The writer must acknowledge his indebtedness to Albert Matthews, Esq., of Boston, for collating the extracts relating to the use of the word '*poquosin*,' without which this paper probably would not have been written. If those desirous of learning the meaning of our early Algonquian place-names would be as thorough in their search for early forms as Mr Matthews has been in this instance, there would be less difficulty in tracing their etymology.

[2] *Names and Places*, 1888, p. 211.

[3] *Virginia Mag. of Hist. and Biog.*, vol. IV, 1896, p. 202.

The earliest printed examples of this topographical application are given by John Lawson,[1] as follows: "As we row'd up the [Santee] River, we found the Land towards the mouth and for about sixteen miles up it, scarce anything but swamp and *percoarson*, affording vast Ciprus-trees of which the French make canoes." On the margin of this page (9) occurs "*Percoarson*, a sort of low land." Lawson further recites: "The swamp I now spoke of, is not a miry bog, as others generally are, but you go down to it thro' a steep Bank, at the Foot of which begins this valley, where you may go dry for perhaps 200 yards then you meet with a small Brook, or Run of water, about 2 or 3 feet deep, then dry Land for such another Space, so another Brook, thus continuing, the Land in this *Percoarson* Valley, being exceedingly rich." Again he wrote: "The first night we lay in a rich *perkoson* or low ground, that was hard by a creek, and good dry land." In the 1860 edition of Lawson's work, the word is modernized as '*Pocoson*.'

A deed of 1714[2] mentions the following boundaries "to an old gum standing by the side of a *Poquoson*, dividing this land, and the land now in the possession of John Dawley, thence running down the East side of s[d] run *poquoson* and marsh to muddy creek." William Byrd[3] (1729) frequently mentions the term, but more especially descriptive is the following: "By the Pilotage of these People we row'd up an Arm of the Sound called the Back-Bay, till we came to the Head of it, there we were stopp't by a miry *Pocoson*, full half mile in Breadth, thro' which we were oblig'd to daggle on foot plungeing, now and then, tho' we pickt our Way, up to the knees in mud." The term was also frequently used by George Washington[4] (1763), for example, "Black mould taken out of the *pocoson* on the creek side."

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[1] *History of Carolina*, 1709, pp. 9, 26, 57, 115.
[2] *William and Mary College Quarterly*, vol. IV, 1895, p. 22.
[3] *History of the Dividing Line*, vol. I, 1866, p. 29.
[4] *Writings*, vol. I, 1889, p. 163.

XUM

W. B. Rogers[1] wrote in 1836: "At *Pocosin*, a flat swampy country, which is often inundated by the tides, this deposite is uniformly met with by digging a few feet." By the adoption of the term by the colonists it was applied to all tracts of land more or less saturated or covered by water, where no Indian would have used it so commonly. This use is shown by W. C. Kerr,[2] who wrote:

"There is a large aggregate of territory (between 3000 and 4000 square miles) mostly in the counties bordering on the seas and sounds known as Swamp Lands. They are locally designated as 'dismals' or '*pocosins*,' of which the Great Dismal Swamp on the borders of North Carolina and Virginia is a good type. They differ essentially in their characteristics from ordinary swamps. They are not alluvial tracts or subject to overflow. On the contrary they occur on the divides or water sheds between rivers and sounds, and are frequently elevated . . . above the adjacent streams."

Still earlier than any of the foregoing, the term was employed in 1635 as a river designation, by B. Symmes[3] who wrote: "For the education and instruction of the children of the adjoining parishes of Elizabeth City and Kingston, from Marys Mount down to *Poquosen* river." This was in North Carolina. In 1692 a record of Virginia stated[4]: "Upon y^e^ petcon of y^e^ pishioners of new *Poquoson* in y^e^ County of York [it was ordered] y^t^ from hence forth forever hereafter y^e^ s^d^ pish Church shall be called and named Charles Church and y^e^ river formerly called New *Poquosin* River shall be for time to time and at all times hereafter be called named and written Charles River." The editor, Dr L. G. Tyler, adds to this quotation: "The change, however, only partially prevailed. The parish became known as Charles Parish but the river is known to day as *Pocosin* River." [*Pocosan*, 1775, Map of

[1] *Report of the Geological Reconnaissance of Virginia*, p. 23.
[2] *Report of the Geological Survey of N. C.*, vol. I, 1895, p. 15.
[3] *Virginia Carolorum*, Neill, p. 113.
[4] *William and Mary College Quarterly*, vol. I, p. 21, note.

Virginia, by Frey and Jefferson; *Poquosin* river, and *Poquosin* flat, Coast Survey chart.]

Many similar examples, from these and other early sources could be quoted to show that the term was invariably applied to low tracts of land in close proximity to creeks or other bodies of water, and occasionally to land subject to overflow from one cause or another.

By consulting the foregoing authorities, it will be observed that the opinions of the lexicographers and others as to the meaning of *poquosin* have been based on the supposition that it was an Indian word for "a swamp or marsh." In most cases, certainly, as the extracts have indicated, such is the meaning apparently attached to it in English; but the question has lately been presented for a decisive opinion as to whether such was the actual meaning attached to it by the Indians. We say it was not, and in order to substantiate our opinion, and to show the true signification of the term, this paper has been prepared.

The word undoubtedly had its origin among the natives of the coast who spoke the Algonquian language, for it was these people with whom the colonists first came in contact. Moreover, the same identical elements, in varying dialectal or corrupt forms, employed with precisely the same descriptive meaning, and applied to similar topographic features, abound as place-name designations throughout the whole eastern Algonquian area.

Not only is this a fact, but in the lonely forests of Maine the radical again appears in its generalized sense in *pokeloken*, a word used by hunters and lumbermen to denote a marshy place or stagnant water extending into the land from a stream or lake.[1]

The question now claiming our attention relates to the analysis and etymologic derivation of the term. The first component, *poquo*, as commonly employed and as first written by Semmes in 1635, or *percoar*, as rendered by Lawson in 1709, is paralleled

[1] W. R. Gerard in N. Y. *Sun*, June 30, 1895.

by the Massachuset (Eliot) *pohqui;* Narraganset (Williams) *pauqui;* Mohegan (Pierson) *paughke;* Abnaki (Rasles) *p∞'k∞ié*, "to open out," "to widen" (primarily "to break"). The terminal *-sin* is the regularly formed diminutive in *s*, with a locative, corresponding to the Lenápe *-es-ing;* Massachuset and Narraganset *-es-et*, or *-es-it*, denoting "at or near" (something understood). Trumbull[1] remarks as to the use of the locative in *et:* "It locates not the object to the name of which it is affixed, but something else as related to that object, which must be of such a nature that location can be predicated of it." Therefore, from this analysis we have the compound word *poquo-es-in(g)*, "at or near the opening out or the widening." Compare, Otchipwe (Baraga) *pâkisse*, "it breaks open"; *pâkissin*, "it is open," plural *paiâkissing*, "it opens"; Abnaki (Rasles) *psaïga∞essen*, "*La rivieré est pleine b'p* [*beaucoup*] *d'eau, v. g. printems.*" The application of the term, therefore, in its linguistic sense was to indicate or to describe localities where water "backed up," as in spring freshets, or in rainy seasons, which, by reason of such happenings, became necessarily more or less marshy or boggy. In a valuable list of our adopted Indian words, contributed to a New York paper (*Sun*, June 30, 1895), W. R. Gerard suggests: "The word *Poquoson* apparently means 'place where there is but little water.'" This is a very good guess, for, as we have shown, there is something "little" in the word, but it is not water.

Heckewelder,[2] in suggesting a meaning for the Virginia river "*Poccosen*," derived it from "*pduckassin* [literally round-stone], the place of balls, bullets, lead,"—a nonsensical etymology; but he was fully as far from correct in his etymology of "*Poquessing*," the Lenápe equivalent (*Poaquesson, Poetquessing, Poquessing*)[3]—a creek flowing through meadow lands toward its mouth and emptying into Delaware river between Philadelphia and Bucks

[1] *Indian Geographical Names.*

[2] *Names*, etc.

[3] *Colonial Records of Pennsylvania*, vol. I, p. 126; *Archeology of Pennsylvania*, vol. I, pp. 116, 117.

counties, Pennsylvania,—which, he wrote, was corrupted from "*Poquesink*, the place of mice." The late Dr J. H. Trumbull[1] regarded *Poaetquessing*—an Indian village at the mouth of this creek mentioned by Campanius—as a disguised *Pawtuxet*, wherein he was mistaken, for the latter name belonged to the falls at Trenton.

On Long island, New York, four miles south of Sag Harbor, near Sagaponack, is a locality and a pond called "*Poxabog*," but more correctly termed *Paugasaboug* according to aboriginal pronunciation. Its main stem was variously written *Pougoso-*, *Pogase-*, and as *Pockgase-*, which accounts for the modern survival. A survey of 1712, laying out the land thereabouts, reads: "Runs into a Litel slade for water ner *paugaseboug*." This name is not a compound of Indian and English, neither is the terminal a "bog," as might be assumed, but is the Algonquian generic *paug*, which, in Long island Indian names, has the form *boug*, "a pond, or a water-place," the whole "an opening-out water-place"—a translation accurately describing the low boggy tract where "*Poxabog* pond" spreads out, as it is doing at the present time, being wider and more open than has been observed in some years. "*Poxabog* road," very good in dry seasons, is now three feet under water and impassable. "*Poxabog* brook," a ditch dug in the last century connecting with "Sagg pond," carries off the surplus water, otherwise the whole neighborhood would be flooded. *Quassapaug* pond, in the northwestern part of Middlebury, partly in Woodbury, Connecticut, the source of Eight-mile river,[2] is probably the equivalent of our *Paugasaboug*, and was originally *Poquassapaug*, and not, as Trumbull suggested, from "*k'che-paug*, i. e., the greatest pond."

Pocasset pond and Boggy meadow at Portland, Connecticut, have the same natural features. On modern maps it is "*Pecausset*." In a deed of 1678, it is the "boggy meadow in *Pacousett*."

[1] *Indian Geographical Names*, p. 9.

[2] Trumbull, *Names in Connecticut*, pp. 56, 60.

Rhode Island has its quota in two "*Pocasset*" rivers: The one in Tiverton gave the name to a hill as well as to the country thereabouts, where the "*Pocasset*" sachemship had its home in former times; the other is in Johnston, and empties into Pawtucket river, just above the city of that name. There are also "*Pocasset* meadows" in Sandwich, Massachusetts. *Pequusset*, and *Pigsqusset*, were the meadows "at the widening" of Charles river, Watertown, Massachusetts, and represent other variations. "*Pecowsic*" brook, flowing down "*Pecowsic*" valley, through the "Agawam" meadows, at Springfield, Massachusetts, is another. *Pawgasett* (1642), *Paugasset* (1672), the low land and meadows at the junction of Housatonic and Naugatuck rivers at Derby, Connecticut, gave the name to the "*Paugasset*" tribe in the annals of Housatonic valley. President Stiles[1] of Yale College wrote the name, as pronounced by a *Paugasset* Indian, *Pawghkeesuck*.[2]

Among the correspondences are some with an additional prefix. For instance, at Montauk, Long island, near the "Ditch plain" Life-saving station, bordering Camp Wikoff on the southeast, lies another low tract of marsh and bog, through which a ditch was dug in the seventeenth century in order to carry off more expeditiously the "backwater," from "Great pond" into the ocean. This locality formed a boundary described in an Indian deed of 1670, and was then called *Choppausha-paugasuk*, i. e., "a place of separation where the outlet opens out or widens." The marsh was no doubt impassable in early days, and even now travel over it is by a bridge and a filled-in road.

On the northern side of Martha's Vineyard, in the town of Tisbury, is a marshy section through which flows a brook once called *Weechpoquasset*. In a deed of May 28, 1669, for the "Christian Town," it is stated: "The bounds of the said land is on the north side of Island bounded by the land called *Ichpoquassett*." In 1699 the same was "bounded on the East by *Ichpoquassett* the black water." We believe "black water," as here written

[1] Manuscript, 1761.

[2] Trumbull, *Names in Connecticut*, p. 46.

and perpetuated in local speech, to have been an error in some way for "back water," which carries out the idea embodied in its Indian name. In 1703 a doubt arose as to its exact location, so a committee "of adged and chief Indians," of Tisbury, was appointed "to show the place that is called *Weechproquassett* creek or water on the bounds between the lands called *Chickammo* and the Sachemship of Takemmy." This committee decided "that the brook of water that runneth into the Sound being to the eastward of *Onkkokemmo* pond is the only ancient place called *Weechproquassett* and the true line." This is earlier confirmed by the grant of "Tisbury Manor," dated July 5, 1771, where "a brooke called *Each-poo-quas-sitt*" is described as the westerly bounds of *Chikkemoo*.[1] The prefix *Ich-*, *Itch-*, *Each-*, or *Weech-*, as variously written, is the Massachuset (Eliot) *Weekqs* or *Wehqs*, "as far as," the "edge," "brim,"—hence, as a whole, "as far as, or to the end of the opening out."

At the southeastern part of the town of Barrington, Rhode Island, is a neck of land now called Rumstock, but known to the Indians as *Chachapacassett*. The eastern side of the neck borders on Warren river, and has a wide margin of meadow, salt-grass, and thatch. In addition, about one-fourth of the area of the neck was subject to overflow at spring tides, and is of a marshy and boggy character. *Chacha-pacassett* (=*K'che-pacassett*) was therefore "at the great widening" of Warren river.[2]

Among the corrupt forms of apparently no connection with the subject term of this paper at first glance, are *Sowassett*, Long island, and *Poughkeepsie*, on the Hudson.

B. F. Thompson, the historian, wrote of the former[3]: "The Indian name of Port Jefferson, L. I., was *Sowassett*, and the cove between it and Setaukett was *Poquott*." After considerable inquiry as well as personal search, Thompson is the earliest

[1] Advance notes from a prospective *History of Martha's Vineyard*, by Chas. E. Banks, M. D., U. S. Marine Hosp., Washington, D. C.

[2] See Bicknell, *History of Barrington, Rhode Island*, 1898, pp. 11, 32, 36, 280.

[3] *Proceedings of the N. Y. Historical Society*, 1845, p. 131.

authority for these two names whom we have been able to discover. They may have survived in tradition up to his day, or he may have found them in some early deed unknown to us. Whichsoever this may be, they have every appearance of some mistake according to our present view, and the two are more likely to have been an original *Poquossett*. This suggestion is apparently confirmed by the fact that Port Jefferson was earlier called "Drowned Meadow."[1]

So far as the name *Poughkeepsie* may be concerned, there appears to be absolutely no question as to its primal identity with the others, and that it was not derived, as Schoolcraft concluded, from "*Apokeepsing*, a safe harbor," as no warrant can be found for that form nor for such a translation. A deed of 1680,[2] to Arnot Veile, for the land thereabout, recites: "Beginning at a creek called *Pacaksing*, . . . to Wápangis Creek along Hudson's River northward to *Pacaksing*"—a form which, by various stages of degradation (among which are *Pocapsing* and *Poghcapsing*),[3] has finally resolved itself into *Poughkeepsie*. The survival and retention of such evolutions in Indian place-names present nothing remarkable nor surprising when we find a scholar like President Stiles writing "*Paugassett*" direct from the lips of an Indian as *Pawghkeesuck*, which was strictly in accordance with the Mohegan dialect; but such variations show the capriciousness of the early forms into which the gratuitous insertion of a letter would have made it *Pawghkee* (*p*) *suck*, from which, to *Poughkeepsie*, the transition would have been still easier even in that name.

This terminates the correspondences of "*Poquosin*," so far as it has progressed, but the list can by no means be complete. The lessons taught are the very close similarities in structure, as well as in meaning and application, among the various dialects of the Algonquian language, as spoken from its extreme limits in the south nearly to its northern boundary.

[1] Prime, *History of Long Island*, p. 226; Thompson, *History of Long Island*, vol. I, p. 432.

[2] Ruttenber, *Indians of Hudson River*, p. 371.

[3] Manuscript order about roads, 1754.

ANTHROPOLOGIC LITERATURE

The Philippine Islands and their People. A Record of Personal Observation and Experience, with a Short Summary of the More Important Facts in the History of the Archipelago. By DEAN C. WORCESTER, Assistant Professor of Zoölogy, University of Michigan. New York: The Macmillan Company. 1898. 8°, xix, 529 pp., 2 maps, ills.

While the greater part of this volume is a narrative of two expeditions through the Philippine islands, the first extending over eleven months and the second over more than two years, a considerable amount of valuable anthropologic material is scattered through the pages. The author is a well-known naturalist of the University of Michigan, and has done excellent work in ornithology and allied branches; and his training in accurate observation gives special value to his notes on the natives. Besides the numerically trifling Caucasian population of the Philippines, there are certain Chinese settlements, and a considerable number of Chinese and a few Japanese resident in some of the cities; but by far the greater part of the population is native, representing more than eighty presumptively distinct tribes. These are grouped by Professor Worcester as Negrito, wild Malay, Mohammedan Malay or Moro, and civilized Malay. The Negritos, supposed to be true aborigines now nearly displaced by the Malay, exist in scattered remnants.

"They are a wretched, sickly race, of almost dwarfish stature. Their skins are black, their hair is curly, their features are coarse and repulsive. They practice agriculture little, if at all, living chiefly on the fruits and tubers which they find in the forest, and on the game which they bring down with their poisoned arrows. Mentally they stand at the bottom of the scale, and experience seems to have proved them incapable of civilization" (p. 438).

Certain tribes, *e. g.*, the Tagbanua, are considered to be hybrids produced by intermarriage between the Negrito and the Malay; while certain peoples are supposed to have descended from the Chinese invaders under Li ma Hong, who landed on Luzon about 1573. The Tagbanua are partly civilized, partly wild; the latter received special attention. Their houses are of palm and bamboo, commonly small and often

perched high on poles so as to be reached only by means of ladders. Their chiefship is nominally hereditary, though the will of the people is final ; trial by ordeal prevails ; theft is punished by fine or beating, and polygamy is forbidden ; wives are purchased from their fathers (indicating patriarchal rule) ; child marriage is common, and children may be betrothed before birth, while divorce is effected by a payment from the party desiring freedom ; among some of the tribe the marriage ceremony is highly elaborate ; the house of a decedent is torn down and his body buried in the forest, his utensils being broken over the grave ; while the corpse awaits burial the friends dread a flying monster, which is supposed to tear the thatch of houses and consume dead bodies within ; they imagine a future life for the good, located deep in the earth in seven stages, the death-giant taking the testimony from a louse on the body of the decedent as to whether he was good or bad, and, in the latter case, casting him into a fire to be completely annihilated ; the tide is ascribed to a gigantic crab, which lets the water into his hole when he comes out and forces it out again on his entry ; they tell that the monkey was once a lazy man at whom a companion threw a stick, which changed his shape and stuck into him in such a manner as to form his tail ; they have a syllabary with which they write on fresh joints of bamboo, in vertical columns. The Tagbanua of Busuanga have shamans who treat disease mystically ; in case of death the selection of a place of inhumation is imputed to the deceased—different places are named while the pallbearers lift the corpse, when, if it seems heavy, the place named is considered unsatisfactory, while if it seems light the place is supposed to be preferred ; the body may be carried a long distance and may either be buried in the earth or deposited in a cave, though it may be placed on a platform ; the property of the deceased is left at the place of sepulture ; there are subsequent ceremonies, including the chanting of an archaic song, and this one is sometimes repeated after the ensuing rice harvest. The Mangyan of Mindoro, another little-known tribe, were observed with special care. The men wear breechclouts, while the married women wear a curious structure of braided rattan coiled about the waist and hips, to which a bark clout is attached, while the unmarried women wear a similar costume with the addition of a separate band of plantain peels about the thorax ; during the dry season they have no permanent habitations, but sleep in extemporized bowers of rattan or palm leaves, while in the rainy reason they huddle on platforms of poles protected by rude roofs of rattan leaves. The Mangyan of the mountains are physically superior to those of the lowlands ; their noses are flat, their heads covered with abundant black hair, sometimes slightly curly, suggesting

admixture of Negrito blood; the tallest of the men measure five feet one and a half inches, and the tallest of the women four feet ten inches; the weapons are bows and poisoned arrows, while fish and small animals are trapped. The highlanders abandon the sick in fear, returning after the death to carry the body into the woods and protect it with a bit of fence and thatch. No evidence was found of belief in future life. They have an ordeal by fire for the detection of theft, while manslaughter within the tribe is punished by forfeiture of property; polygyny prevails, while polyandry is forbidden; children marry at eight years or older, the marriage being arranged by the elders. The lowland Mangyan are omnivorous, delighting in crocodile-meat, consuming carrion on occasion, and reveling in immense white grubs from the sago palm, taken alive and swallowed squirming; yet they have a rather elaborate process of extracting sago starch for food. They also abandon the sick, but sometimes steal back; if the patient is improved they succor him, but if death has occurred they flee, deserting the house with its contents, and closing paths leading to it. Afterward the relatives conceal themselves in the jungle and change their names. They place profound faith in fetishes, and evidently are controlled chiefly by fear of vague mythical potencies, though the author was unable to obtain definite ideas of their cheerless faith. The Moro form the most conspicuous element of the Filipino population; they comprise a number of tribes of varying characteristics. They profess Mohammedanism, but most of them retain savage traits, sometimes intensified by the curious fanaticism accompanying barbaric belief; they furnish occasional examples of the culminating self-sacrifice of Mohammedan martyrdom in devotees who seek to buy eternal happiness by running amok and slaying Christians until they are themselves slain. Some of the Moro are head-hunters; others set out on the death of a relative to kill the first person they meet as a sacrifice to the manes. The civilized Malay, as a rule, are kindly and hospitable, tolerant of any but the harshest government, fairly honest and susceptible of industrial and social improvement, although of course without the vigorous physical, mental, and moral characteristics of the Caucasian. Though not professedly a scientific book, the work is based on personal observation and was written by a scientific man, and is accordingly well worth the attention of students. It is handsomely printed, fairly illustrated by photomechanical reproductions, and artistically bound.

W J McGee.

Die Sprache der Bribri-Indianer in Costa Rica. Von H. PITTIER DE FÁBREGA. Herausgegeben von Dr. FRIEDRICH MÜLLER. Wien, 1898. 8°, 150 pp., map.

This monograph appeared in the *Sitzungsberichte* of the Academy of Sciences of Vienna, and was issued about two months after the death of the distinguished editor. Professor Müller was certainly the most comprehensive student of languages of his generation, although probably not the most profound of linguists. He did not venture deeply into the philosophy of human speech, and treated languages more from their historic and ethnographic aspects.

For his knowledge of American idioms Professor Müller stood easily first, his great work, the *Grundriss der Sprachwissenschaft*, presenting the analysis of forty-two of these tongues. No one, therefore, could have edited with greater ability the collections in the Costa Rican languages made by Dr Pittier de Fábrega, the President of the Physico-Geographical Institute of that republic.

With characteristic frankness, Professor Müller acknowledges that his explanation of the Bribri verb given in his *Grundriss*, Bd. II, Ab. I, pp. 319, 320, is shown to be incorrect by the new material. He had there stated that the verb was composed of a verbal stem and an inseparable pronominal prefix, and hence the intransitive verb could be regarded as a term of possession. It appears, however, that when the subject is expressed, and sometimes when it is not, the pronominal form may be omitted; nor is the position of subject and object to the verb of a fixed character, as both may precede or follow it.

In these respects the Bribri verb differs from the plan of most American tongues. It is less "incorporative" in its morphology. But that all signs of this process are absent would be far too much to say. The regular construction is to place the object between subject and verb; and there is a class of verbs which permits the object to be infixed (p. 50). It is also stated (p. 40) that the original form of the verb was a substantive with an attached pronominal increment.

Professor Pittier is of opinion that there is in the first person plural an inclusive and an exclusive form; but the editor could not find evidence of this in the texts.

In rendering the sounds of the language, the same alphabet is adopted as in Professor Müller's large treatise. The words differ widely from those in the extensive vocabulary published by William Gabb in 1875; but this is explained by his inaccuracies rather than by a change in mode of utterance. Nevertheless, Professor Pittier acknowledges (p. 26) that it is practically impossible to present an

accurate phonetic spelling, especially as the pronunciation of individuals varies, a circumstance which he curiously attributes to the indolence engendered by a tropical climate.

Both linguistically and ethnologically the original texts offered deserve comment. They are four stories or myths with an interlinear and a free translation. They tell of how the devil *Jaburú* once ate up the human race; how the good god *Sibu* killed the evil spirit *Sórkura;* how in ancient times men were consumed by beasts and birds; and the adventures of a hunter in the house of the King of the Tapirs. They are delightfully fresh and primitive. The name of the highest good god is *Sibu*, which appears to be a derivative from *si*, moon. To him, or to one of his forms, *Sibu-sura*, is attributed the creation of the world, and to him go the souls at death. His power of creation, like that of many demiurgic beings in American mythology, is by thought. That which *Sibu* thinks is by that subjective act realized in the objective world. Thought itself is expressed by "that which shakes the liver"; or "that which the liver hears" (*en-bi-kuk*). This notion that the liver is the seat of the intellect is also frequent elsewhere in primitive America.

The general relations of the Bribri language are fully discussed and lead to conclusions of great moment. It has no affinities with any language farther north. On the other hand, it has unquestionable and constant affinity with the other dialects of Costa Rica, including the Guatuso of Rio Frio, and with the idioms of Chiriqui, Veragua, Panama, and the northern portions of South America, notably the Cuna and Chibcha. *The ethnic line of demarcation between North and South America is the Nicaraguan depression*, just about the track of the proposed interoceanic canal. In the *American Race* (p. 164) I stated that this line was the mountain chain which separates Nicaragua from Costa Rica; the union of the Guatuso with the Costa Rican stock, removes the line from the mountain crests to their northern base. In this general statement we do not attach importance to the small Nahuatl colonies who had advanced south of the line, nor the possible relations of the Mazatec to the Talamancan group. These were minor historic incidents not affecting the trend of the great migrations.

The linguistic portion of the volume has an ethnographic introduction in which the author discusses the former distribution of the Indian tribes in Costa Rica, their present locations and conditions, and a special ethnologic account of the Bribri. Under the first of these subjects Professor Pittier disputes Señor Peralta's opinion of the extension of the Nahua in Costa Rica. In this he may be right, as local names are not always evidence of the permanent presence of the tribes

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in whose tongue they occur; but in his assertion that the Guetares were "a mixture of many stocks," he is in direct conflict with the linguistic evidence. They were, as I have shown, pure members of the Talamancan stock.[1]

The social relations of the Bribri are matriarchal. The children belong to the totem of the mother, and the most valued possessions of a man pass at his death to the eldest son of his eldest sister, or to his sisters. Stringent rules prevail in reference to ceremonial uncleanliness, especially in sexual relations.

A remarkable statement is made as to the acuteness of their sense of smell. Not only can they distinguish by it what kind of an animal has crossed their path, but, by the intensity of the odor, what time has elapsed since it went by.

The admirable presentation of the material in this book renews our sense of the loss of the learned editor, and encourages the hope that Professor Pittier will be incited to still further researches in this productive field. D. G. BRINTON.

Introduction to the Study of North American Archæology. By Prof. CYRUS THOMAS. Cincinnati: The Robert Clarke Company. 1898. 8°, xiv, 391 pp., 108 illustrations.

It is a bold writer who, in the present stage of the study of American archeology, ventures to monograph that subject, and it is a fortunate one who proves himself capable of compassing the field in a satisfactory manner. Professor Thomas does not take the full risk, however, since he omits South America from consideration and passes over physical anthropology and the geological features of the subject. There is left the great body of antiquities of North America, which the author proceeds to present in a well condensed and lucid manner well suited to the purposes of an *Introduction.* Passing attention is given to tradition, language, folklore, mythology, customs, and craniology, since these branches are useful in illumining many of the obscure corners of prehistoric times; but the monuments and minor art remains form the chief bases of the work. Admitting correctly that prehistoric archeology is yet in its infancy, he permits himself to say that this branch is not as yet a "true science," an expression that must be considered as unfortunate. The difficulty with archeology as it stands today is not that it is unlike any other field of scientific research in character, but that it has been so often treated in an unscientific manner and by writers having little conception of scientific method. It is a science

[1] *Proceedings of the American Philosophical Society*, December, 1897.

in so far as its complex and obscure data are correctly observed, treated, and applied to the elucidation of human history.

The difficulty of classifying the subject matter of archeology is pointed out by the author, and proper stress is laid on the shortcomings of European classification and nomenclature as applied to America. In presenting the subject, the objective data are arbitrarily but conveniently arranged in three great groups, viz: monuments, relics, and paleographic remains. These are not to be grouped or studied as a whole on this plan, but the continent is divided into three parts, called culture areas, and in each of these the remains are independently studied and discussed, and so far as necessary comparisons are made with the other areas and with other continents. The method, therefore, is primarily geographic and secondarily typologic or ethnic. The three divisions are the Arctic, the Atlantic, and the Pacific. The separation of the Arctic division is natural enough, and Professor Thomas refers to the separation of the Atlantic and the Pacific as follows:

"One of the first impressions made upon the mind of the student of North American ethnology is the resemblance in a broad and general sense of the features, customs, arts, and archæological remains of the west coast to those of the islands in and countries bordering on the Pacific ocean, while on the other hand there is no such resemblance between them and those of the Atlantic slope. In other words, the types when classified in the broadest sense appear to arrange themselves in two general divisions—those belonging to the Pacific slope and those confined to the Atlantic slope" (page 17).

In chapter III a few pages are devoted to the methods of study adopted. Though the natural order of presenting the data of human history is to begin with the earliest traces of the race and to proceed in chronologic order to the latest, the author in his special field chooses to begin with the well known in native American history, and to carry investigation back along various important lines into the remote and obscure realms of prehistoric times. Thirteen pages are given to the very limited archeological phenomena of the Arctic division, and the author then passes to the Atlantic division in which he himself has been a leading investigator. Questions relating to the mound-builders claim first attention, and the matter presented possesses exceptional value, coming as it does from the pen of one so familiar with the field in all its varied aspects. His conclusions are, in brief, that the mound-building peoples were Indians (as the term is commonly accepted); that mound-building began in the Mississippi region many centuries ago and continued down to the coming of Europeans, and that the mound-builders are represented in a number of existing tribes, some of which have been fully identified. The subject of the origin and migra-

tions of the North American tribes appears prominently in this chapter. The theory of an Asiatic derivation is favored, and the general trend of the evidence is held to indicate that "the place of dispersion was in the northwest, and that the course of migration has been south and southeast" (page 162).

The Pacific division is reviewed under several headings—California section, Intermontane section, Gila Valley and Chihuahuan section, Mexican section, Southern Mexican section, and Central American section. This field is in general effectively presented, considering the aggravating lack of reliable data, while the discussion of certain features of Central American remains and culture, to which Professor Thomas has given long and careful attention, has special interest and value. The origin of the peoples he traces generally toward the north, and although suspecting intrusion of foreign elements of culture, discusses the archeologic remains from the autogenous point of view, striving with the usual lack of success to account fully for all the remarkable conditions and extraordinary phases of culture development.

In the final chapter the author presents some general considerations regarding migrations in prehistoric times. Assuming that the movement of the peoples was largely from the north toward the south, he discusses the modifications of culture brought about as temperate climes were reached and the reaction of the progress made on the northern areas. For the South American peoples and antiquities he is not able to find a satisfactory origin, as there appear to be no especially well-defined relationships with those of the North American continent.

Within the field considered, this work by Professor Thomas is far more satisfactory than anything yet written, and it must contribute not a little toward building up the science of archeology in America. It will serve admirably the purpose for which it is presented, and at the same time will form a stepping stone by means of which some other student, utilizing the fuller data of his day, may climb to higher levels.

W. H. HOLMES.

Cuba and Porto Rico with the Other Islands of the West Indies. Their Topography, Climate, Flora, Products, Industries, Cities, People, Political Conditions, etc. By ROBERT T. HILL of the United States Geological Survey. New York: The Century Company. 1898. 8°, xxviii, 429 pp., 2 maps, 79 pls.

Although the work of a geologist, several chapters of this notable volume contain matter of interest to anthropologists. The material is derived largely from personal notes of a trained observer during protracted visits to several of the islands in the course of the last five years, these notes being enriched and supplemented by critical study of

technical and historical literature. The chapter on the people of Cuba presents an appreciative and pleasing picture of a much-misunderstood folk, and summarizes conveniently the hereditary and industrial classes comprising the population of the island. The Cubans are classed as white, colored (mestizo or mixed), and black; and it is pointed out that, up to the recent revolution and the consequent Hispano-American war, the white population alone has been able to hold its own, while the blacks and mestizos have steadily decreased in number. "The five hundred and twenty thousand people of African descent, one half of whom are mulattos, represent the diminished survival of over one million African slaves that have been imported" (p. 105). In addition to Spaniards and other Europeans, the people of Puerto Rico are divided into four classes: "The better class of creoles, who call themselves Spaniards; the lower class of white peasantry, known as *gibaros;* the colored people, or mestizos; and the blacks" (p. 166). The aborigines are entirely extinct as individuals, though there are a few persons whose hair and color indicate a mixture of Indian and negro blood. Race feeling is strong; the negroes form a numerical minority of the inhabitants, yet are contented with their lot, which "is much better than that of the negroes in the French, English, and independent islands" (p. 168). Although a model English colony, the island of Jamaica is shown to be populated chiefly by negroes; in 1891 there were 488,624 blacks, 121,955 colored, only 14,692 whites, with 10,116 East Indian coolies, 481 Chinamen, and 3623 unclassified. "The Jamaican negroes are *sui generis;* nothing like them, even of their own race, can elsewhere be found—not even elsewhere in the West Indies" (p. 227). Though they outnumber the whites nearly forty to one, they have no voice in governmental affairs; yet they appear to retain definite traces of social organization, imported with enslaved ancestors from Africa, which doubtless facilitates governmental control. They are said to retain much or all of their primitive mythology beneath a scant veneer of the alien cult impressed by white masters. Clerical teachings have little effect on their simple minds; "only the ceremonial and emotional phases impress them; an empty bottle,—a potent power of evil,—if set down at the door of a congregation, would send it into paroxysms of fear" (p. 229). The rustling of the wind through a ceiba-tree, mythic dwelling-place of jumbies, instantly effaces Christian sermon and ceremony; even the educated young women of a normal school have been known to faint at sight of spilled mercury, trembling and sending forth distorted images with the shaking of the floor. Their belief is termed obiism; it is a faith in mystical potencies, chiefly of evil, haunting places

and things, combining with the forces of nature, attending the dead and the sepulcher, assuming protean but always animate forms—a stage of belief in which characters of zoötheism and psychotheism are curiously blent with traces of the commonly intermediate physitheism. The attendant worship is essentially secret, at least so far as whites are concerned, but is known to be ceremonial and sacrificial; ostensibly at least, the principal sacrifices are cocks and goats, though there is reason to opine that the "goat without horns" (*i. e.*, the human child) is still sacrificed in the outlying districts. In some of these districts there is a class of blacks, descendants of escaped slaves, known as maroons, who are partially free of English rule, though the author does not note especial prevalence of primitive beliefs and ceremonies among them. Even about the market places and kitchens, and indeed in the domestic schools around the white man's house, there is no lack of primitive characters; the men tell stories of the donkey who would go hunting like the tiger, and how his courage failed, or other African tales in which the rabbit, lion, elephant, and other animals play leading roles; while every mother sings or chants an alphabet rhyme, which every Jamaican can repeat, and which has even gone into print in Jamaican primers:

A is for Assinoo,[1] see how him stan'!
B is for Buckra,[2] bery bad man.
C is for Pussy; him name Maria.
D is for Duppy[3]; him eye shine like fire.
E is for Eel; him catch in de ferry.
F is for Figgler[4]; him play sweet, bery.
G is for Governor; him live at King's House.
H is for Dry-Harbor, place poor as church-mouse.
I is for Miyself. When I sick, I go to bed.
J is for Jim Crow; he have a peel head.
K is for Kalaloo,[5] bery nice when him boil.
L is for Lizard, but him tail 'poil.
M is for Monkey; just look 'pon him face.
N is for Nana[6]; him cap trimmed with lace.
O is for Oliphant[7]; him have a big mouf.
P is for Potto[8]; when night come he go out.
Q is for Quattie[9]; I beg you one, massa, please.
R is for Ratta; him tiptoe 'pon cheese.
S is for Snake; him crawl in de grass.
T is for Toad, so farr'ard an' fast.
U is for Uncle. Boy, you tell him howdee!
V is for Vervine[10]; make very good tea.
W, X, Y. Hi! I really forget.
Z is for Zebedee, mending his net.

[1] Ass, donkey. [2] White man. [3] Ghost. [4] Fiddler. [5] A kind of bird [6] Baby (a corrupted Spanish word). [7] Elephant (this word is from the old Scotch settlers). [8] Owl. [9] A fourth of a farthing. [10] A plant.

The republics of Santo Domingo—San Domingo and Haiti (the "Black Republic")—are of peculiar interest to students of institutions; they are described at some length, and the striking episodes in the history of the island are recorded summarily in such manner as to show the course of a forced institutional development through the several normal stages up to an apparently premature enlightenment—a government of primitive people, by primitive people, for primitive people. The author's impressions of the Black Republic are more favorable than those of some other travelers; he does not hesitate to express the apparently just opinion that it represents "the most advanced negro government in the world" (p. 288); and he finds fair indications of intelligent progress giving promise of future order and continued development. Much of Mr Hill's thirty-seventh chapter is devoted to a general discussion of obiism, or witchcraft, in which he acknowledges assistance from Mr W. W. Newell. He traces certain phases of belief found in the West Indies, and also in southern United States, to European contact, pointing out that the voodoo or voudou (corrupted to "hoodoo" north of Mason and Dixon's line) is more correctly rendered vaudoux, a term derived from the province of Vaudois and the sect known as Waldenses. The volume is in every respect a most attractive specimen of book-making. It is an important contribution to American literature of the substantial sort.

W J McGee.

Der Ursprung der Afrikanischen Kulturen. Von L. Frobenius. (*Der Ursprung der Kultur*, erster Band.) Berlin: Verlag von Gebrüder Borntraeger. 1898. 8°, xxxi, 368 pp., 9 pl., 225 figures, 26 charts.

This is the first instalment of an extensive work on the "origin of culture" (*Ursprung der Kultur*) in all parts of the globe, and even a cursory inspection impresses one with the comprehensiveness of its scope. In examining this part of the work, which is devoted to the African aborigines, one is impressed by the completeness with which the results of recent exploration have been gathered and digested, and the familiarity of the author with the rich collections of African objects in European museums. In the opinion of Dr Frobenius, a study of the beginnings and the gradual development of the elements of African culture, and the observance of their equivalents or similarities in other countries, will go far toward revealing the political, social, cultural, and religious history of the people. He defines culture as by no means identical with civilization, but as the first step in the elevation of a brutish people toward a higher plane, while civilization is an aggregation of cultural elements in one people. Those who attempt to trace

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the historic origin of a nation may expect to find its most ancient vestiges in its objects of manufacture—the style and forms of its weapons, its hunting, fishing, and domestic implements, works of defense, dwellings, and the like. Especially in Africa, where relics of a prehistoric epoch are almost absolutely wanting, the above articles alone, when subjected to comparative study, disclose primeval conditions.

It is the conviction of Dr Frobenius that close study of the implements, dwellings, etc., of a people discloses the transmission or adoption of the styles perceptible in them, and thereby also the migrations of the tribes or nations themselves; and by combining all the data available, the author believes it possible that all African migrations can be narrowed down to two great continental currents with a single intermediate current connecting the two. The migrations of the first current extend back and forth between Senegambia and the upper Nile in about 12° north latitude, those of the second current between the Congo headwaters and the upper tributaries of Oranje river in Cape Colony. The single intermediate current connects the eastern end of the northern current with the lake country on the headwaters of the Nile; but the territory of the middle and lower Congo, and the Hottentot or Nama country, were never subjected to direct migratory influence. But Frobenius traces influence of the people of southwestern Asia in the tribes south of the Somali countries, and presents reasons for an apparent Malayo-Nigritian style in the arts of a portion of southern Africa.

The author's conclusions regarding the migrations are based partly on fact, and, he confesses, partly on theory only; nevertheless they approach certainty, because their occurrence is substantiated by the condition of the linguistic stocks of the interior. The oldest linguistic families are still found in their earliest habitat, never having been displaced by others—for example, the stocks of the Soudan and the Hottentot family,—whereas people speaking the Bantu dialects, who now cover an enormous territory, were scattered by the intrusions of the Zulus and other tribes. In fact, the name Bantu does not designate "a race" of African men, though often mistaken to mean this; it means only a family of dialects which originally belonged to the second or north-and-south current of migratory tribes. Lately a Bantu dialect, that of the Ashingini, has been discovered as far north as 11° north latitude.

The African aborigines live mainly by agricultural and pastoral pursuits, and in some districts the stock-raising peoples hold the tillers of the soil in subjection. Those who live solely by hunting are limited to the Bushman or Sān race. Slavery, the result of the hostile inter-

course of tribes which have been carried along by the above-mentioned currents of migration, is almost general. In the arts and manufactures the negro is assiduous, but he lacks originality in creating new forms or types. Inventiveness is not his specialty, and art in our sense of the term is unknown to him. The more primitive man is, the less he distinguishes, in legend and story, between man and animal, or between these and certain inanimate objects, as the celestial bodies. In his myths the sun, the moon, and animals are personified, being endowed, equally with himself, with speech, mind, and shade or soul. A highly developed animism pervades all his mythology, and sorcery supplies the means of explaining mysterious natural phenomena.

The principal portion of Dr Frobenius' first volume is devoted to a description of certain classes of implements and artifacts, their genesis, history, uses, and areas of distribution. The numerous illustrations disclose many interesting details. In the north, shields are of leather; in the west they are of wood and cane; in the south, of hide; and they vary greatly in shape according to the locality. Lances, darts, and javelins are found wherever shields are in use, but where bows are commonly employed shields disappear altogether. In the north the bows are covered with leather, and their forms indicate Asiatic origin. Knives, daggers, and swords are due to a thrifty iron and steel industry which has been in vogue from an early epoch; asymmetric knives are frequently met with, the handles being of the most varied shapes.

Dr Frobenius presents a large body of information concerning other instruments and implements used by the native tribes, many of which are illustrated. With the multifarious forms of war-clubs and tomahawk-axes of hardwood and metal, throwing-clubs or boomerangs are treated, and also throwing-knives with one or several points or blades, some of which must have evolved from spearheads. Arrows are shown to have either flat or spiked points, as have the spears and darts. The native stringed musical instruments are numerous; drums and bullroarers of wood are also prominent, and communication by means of drum-signals, so familiar to many travelers, is noted. Buildings are erected of various materials, and are either hemispherical or conical, though the earthen houses form a class by themselves. The vases and smoking utensils show great diversity, as do also the sculptured objects, especially the statues and temples dedicated to gods and godesses.

Of the colored charts accompanying Dr Frobenius' memoir, five of them illustrate the distribution of shields according to the material used in their manufacture; another chart illustrates the range of materials from which garments are made, such as skins, cotton, palm-fiber,

and bark; others exhibit the distribution of the bow within the area of the Congo basin, the Malayo-Nigritian style of dwellings, masks, clothing, tattooing, stringed-instruments, wooden drums, sirimbas, and knives. The author distinguishes seven distinct types of architecture south of Niger river, and their distribution is shown on one of the charts. Still another chart illustrates the range of banana and millet culture, as well as of pastoral life.

When a few more works of this character have been presented, much light will have been shed on the ethnography of the Dark Continent.

A. S. GATSCHET.

Truth and Error or The Science of Intellection. By J. W. POWELL. Chicago: The Open Court Publishing Company. 1898. 12°, 428 pp.

This is a book of great and vigorous originality. The work of a special investigator in several branches of science (in two of which he has attained eminence) and a sympathetic student of the other branches, its foundation is broad and strong, and its author's warrant for putting it forth as an epistemology would seem to be ample. It is not primarily anthropologic, save in that it recognizes throughout the psychic factor which enters every sound system of interpreting nature; yet it is designed to serve as a basis for the classification of anthropology as well as the other sciences. Traversing the sphere of human knowledge as it does, condensed by years of synthesis as it has been, and written for the physicist and naturalist and metaphysician as it was, the book is not easily summarized; but three of its features may be noted briefly: 1. Throughout the author attempts to interpret nature from its manifestations in the human mind, and to interpret the mind as the most delicate and complex product of the endless interactions of nature—*i. e.*, the author sees mind as the reflection of nature, and seeks to interpret each in terms of the other. 2. Accepting the current scientific doctrine of the conservation of energy, the author extends and modifies the current form of the law so far as to recognize the persistence of energy in the particle and in the form of motion ever-changing in direction, but constant in quantity. 3. Accepting the results of modern researches in psychology, the author out-passes some of his contemporaries by recognizing consciousness (or rather the potentiality of consciousness, as this term is commonly used) as one of the primary attributes of the ultimate particle; the potential consciousness becoming effective with organization, and culminating in effectiveness only in the most highly developed organs of the highest organisms. Most

if not all of the more strikingly original features of the book may be reduced to these fundamental ideas. A literary feature of the book is the definite terminology deemed necessary to express the comprehensive ideas set forth in its pages; the terms are to some extent novel, though far less so than the ideas which they are made to convey; and readers assimilating the fundamental ideas will probably have little difficulty in understanding the terms, though the more superficial reader will undoubtedly find the specific and definite terminology hard, even repellent. Yet few of the terms are new; it seems to have been the method of the author rather to employ old terms with restricted meaning. It is an open question whether language is better enriched by coining new terms to fit new ideas, or by redefining old terms as ideas grow more definite; certainly the author of *Truth and Error* has adopted the latter course; certainly, too, the reader will find his task difficult unless he recognizes the exceptional definiteness of the terminology extending from the introductory chapter to the summary. The book-making is neat and simple, weakened by a dedication and strengthened by a fair index to the difficultly indexible contents.

W J McGee.

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NOTES AND NEWS

The Butterfly and the Spider among the Blackfeet—Not very long ago, in *Forest and Stream*, I called attention to the belief held by the Blackfeet Indians that dreams are brought to us in sleep by the butterfly (*ăp ŭ'nnĭ*). As my informant said:

"You know that it is the butterfly who brings us our dreams—who brings the news to us when we are asleep. Have you never heard a man say, when he sees a butterfly fluttering over the prairie, 'There is a little fellow flying about that is going to bring the news to some one tonight'? Or have you not heard a person say after night, as the fire burns low and the people begin to make up their beds about the lodge, 'Well, let us go to bed and see what news the butterfly will bring'?"

I called attention also to the sign for the butterfly—a design roughly in the shape of a maltese cross, one arm horizontal and the other vertical, which is painted on most of the more elaborately ornamented Piegan lodges, just below the smoke-hole and between the wings at the back of the lodge. This sign painted on a lodge indicates that the style and method of painting the lodge were taught the lodge owner in a dream. More recent inquiry leads me to suspect that the influence of the butterfly is not confined to dreams but covers sleep as well.

Fig. 3—Blackfoot butterfly symbol.

It is still a custom for the Blackfeet woman to embroider the sign of the butterfly in beads or quills on a small piece of buckskin, and to tie this in her baby's hair when she wishes it to go to sleep. At the same time she sings to the child a lullaby, in which the butterfly is asked to come flying about and to put the baby to sleep.

The word *ăp ŭ'nnĭ* appears to have some relation to *ăpă wā'nĭ*, which means "talking around," or "talking in different places," "to go about telling news." *Ā wā'nĭ*, "he says"; *ăp ă wā' wā kā*, "he walks about." The prefix *ap* seems to denote presence or existence in different places.

I have not been able to learn why or how the butterfly brings dreams or sleep. It is stated merely that it is soft and pretty and moves gently and that if you look at it for a long time you will go to sleep.

How widespread the faith in the butterfly as the American sleep-

producer may be—and this cross as its sign—I do not know. My direct testimony comes only from the Blackfeet, but the belief may well have been shared by their old-time allies, the Atséna or Grosventres-of-the-prairie, and the Sarsi, who with the three tribes of the Blackfeet nation—Sĭ'ksĭkau, Kaĭnah, and Pikŭ'nni—made up the five tribes of the "Prairie people." It is suggestive, too, that on the head of a Kútenai baby-board in my possession, there are embroidered three conventional sprays of flowers, each flanked on either hand by a cross, which certainly would have signified the butterfly as the sleep bringer, if the board had been ornamented by a Blackfoot woman. Crosses appear on two baby-boards figured in Prof. O. T. Mason's paper on *Primitive Travel and Transportation.*[1]

On a very large lodge shown in an old photograph of "Southern Cheyenne wigwams," kindly loaned me by the Bureau of American Ethnology, appear four maltese crosses, quite like those shown on some Blackfeet lodges, except that they are much larger and are differently placed on the lodge, being in pairs one above the other. The upper series is well below the smoke-hole, and the lower is just above the ground painting, which seems to extend four or five feet up the side of the lodge. It looks as if the complete upper series of crosses runs entirely about the lodge, and the lower series also, except where interrupted by the door.

Still more to the point is the fact that on some prehistoric Hopi or Moki pottery collected by Dr J. Walter Fewkes, and now deposited in the National Museum, appears a figure identical with the Blackfoot sign for the butterfly, and in close juxtaposition to it the unmistakable figure of a noctuid moth. It will be interesting to learn whether this belief in the butterfly as the god of sleep and this same sign for it have any general currency among the western Indians.

The use among the Dakota of the Latin cross to denote the dragonfly as a warner of the approach of danger, is interesting in this connection.

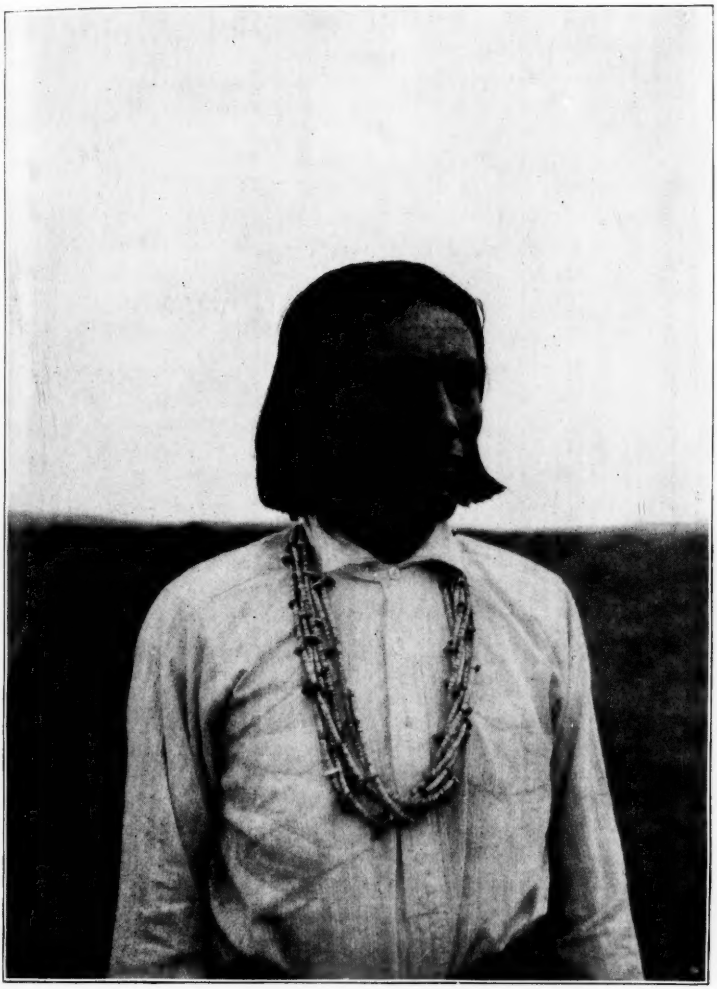
The Piegan Blackfeet call the spider "underground deer" (*ksū' ā wā kōs*), no doubt because of its rapid movements and the readiness with which it disappears from sight when disturbed. Its activity and supposed intelligence cause the Indians to hold it in high esteem. In ancient times there were religious beliefs and a ceremony about the spider, and though much of this has been forgotten, the animal still possesses a more or less sacred character among these people, so that even today in the ceremony of the medicine-lodge, the medicine-lodge women pray briefly to the spider and ask help from its intelligence.

[1] *Smithsonian Report*, 1894, pp. 516, 517, figs. 207, 208.

It is unnecessary to refer to the position which the spider holds in the beliefs of many other tribes. The subject is a familiar one. I may call attention, however, to the fact that among both the Cheyenne and the Arapaho the same word is used to denote "spider" and "white man," and that in both languages this word appears to convey the idea of high intelligence, being almost the equivalent of "wise or intelligent one."

GEORGE BIRD GRINNELL.

Death of a Celebrated Hopi—Kópeli, the Snake chief at the Tusayan pueblo of Walpi, Arizona, died suddenly on January 2, 1899. He was the son of Sáliko, the oldest woman of the Snake clan, which is one of the most influential as well as the most ancient in Tusayan. His father was Súpela, one of the chiefs of the Pâtki, or Rain-cloud people, who came to Walpi from southern Arizona about the close of the seventeenth century. As chief of the Snake priests at Walpi in the last five presentations of the Snake dance at that pueblo, Kópeli had come to be one of the best known of all the Hopi Indians. He inherited his badge of office as Snake chief from his uncle, and was the only chief in Tusayan who had a Snake *típoni*. His predecessor in this duty was Nuvaiwinû, his uncle, who is still living, and who led the Snake priests in a single ceremony, after which it was found necessary for him to retire on account of his infirmities. At the celebration of the Snake dance in 1883, described by Bourke, Nátciwa, an uncle of Kópeli, was Snake chief. The oldest Snake chief of whom I can get any information was Murpi, a contemporary of Macali, the Antelope chief preceding Wiki. Kópeli was a relative on his mother's side of both these men. At the time of his death Kópeli was not far from 25 years of age; he had a strong, vigorous constitution, was of medium size, with an attractive face and dignified manner that won him many friends both among his own people and the Americans with whom he was brought in contact. He was a thoroughly reliable man, industrious, and self-respecting. Although a conscientious chief of one of the most conservative priesthoods in Walpi, he was a zealous friend of the whites, and supported innovations introduced by them for the good of his people. He believed in the efficacy of the ceremonial rites of his ancestors, and performed his duty as priest without shirking. As Mr Thomas V. Keam, who knows the Walpi people better than any other white man, told the chiefs in council a few days after the Snake chief's death, "Kópeli was the best man of the Mokis." He was a *pac lólomai táka*, an excellent man, whose heart was good and whose speech was straight. To most Americans who are interested in



KÓPELI, LATE SNAKE CHIEF AT WALPI

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the Hopi, Kópeli was simply the energetic chief, in barbaric attire, who dashed into the Walpi plaza leading his Snake priests in their biennial Snake dance. This is one of the most striking episodes of the ceremony, and its dramatic effect is not equaled in any of the other pueblos. It was through Kópeli's influence that the Snake dance at Walpi was the largest and most striking of these weird ceremonies in the Hopi pueblos. Kópeli welcomed the educational movement, and had two children in the school at Keam's Canyon at the time of his death. He was buried among the rocks at the base of Walpi mesa with simple ceremonies appropriate to a chief of his standing. The accompanying portrait is from a photograph made in the summer of 1898 by Mr A. C. Vroman of Pasadena, California.

J. WALTER FEWKES.

Ohio Ethnology and Archeology—The first number of volume VII of the *Quarterly* of the Ohio Archeological and Historical Society, containing 203 pages, illustrated, is devoted entirely to a memoir on the "Indian tribes of Ohio—historically considered," and a "Report of field work in various portions of Ohio," during 1898, by Mr Warren K. Moorehead. The preliminary paper on the Ohio Indians, which occupies the first 109 pages of the journal, is devoted chiefly to a summary of the Indian history of the state subsequent to 1750. Although necessarily compiled, Mr Moorehead has managed to bring into condensed form the chief events of this important period of the state's history. The principal importance to those already familiar with the history is the localization of events in consonance with modern geographic names. The only criticism, perhaps, is the distinction the author makes (page 15) between the "Chippewas" and "Ojibeways," which are in reality synonymous terms.

Unfortunately, Mr Moorehead, on account of ill health, was compelled to be absent from the state during the entire season, hence was unable to devote personal attention to the field work. Although he found a worthy substitute in the assistant curator, Mr Clarence Loveberry, an industrious and conscientious explorer, it is evident, from what he states in regard to the mounds and other works excavated, that more information would undoubtedly have been given had Mr Moorehead been constantly on the ground. Although no remarkable discoveries were made, the collections were considerable and valuable in making up the data relating to the archeology of Ohio, especially of Scioto valley, where the works examined are situated. The discovery of the remains of wooden vaults, and of layers of bark accompanying burials, forms cumulative evidence that the works of this

particular region are due to one people and belong to the same era. The results also tend to strengthen the belief that the builders of these works were related to the builders of those in Kanawha valley. The additional statistics in regard to the number, character, and distribution of the mounds given in the latter pages are worthy of notice. It is hoped that financial aid to continue this work will be furnished liberally, as these ancient monuments are rapidly being obliterated. It may not be out of place to suggest that it would perhaps be best to confine the work of a season to a more limited district, thus making the explorations more thorough and complete.

CYRUS THOMAS.

Rare Indian Books Found—Within the last year there have come to light three rare books of interest to students of American Indian linguistics. One of these is the anonymous *Primer for the Use of the Mohawk Children* (sq. 24°, 97 pp.), printed by Fleury Mesplet at Montreal in 1781, which hitherto was supposed to be unique, the only copy believed to exist being in the British Museum library. This little volume was formerly the property of Rev. Samuel Kirkland (1741–1808), who for more than forty years was a missionary among the Iroquois; but through a collateral branch of his family it found its way to California, where, about a year ago, it came in possession of Mr P. J. Healy, a book collector of San Francisco. Special interest attaches to the little primer from an historical point of view, as it was doubtless the product of the first printing-press set up at Montreal.

Of no less importance was the discovery, a few months ago, in the library of the late Horatio Hale, of Clinton, Ontario, of a copy of the 173–? reprint of the anonymous *Indiane Primer*, in the Massachuset dialect, printed at Boston by B. Green in 1720, the only other copy extant being in the Lenox library, New York City. Both the known copies are imperfect, the Lenox copy lacking 38 of the 84 leaves, while from the Hale copy 10 leaves are missing. Neither volume contains the title-page, hence the exact date of this reprint still remains unknown. The original edition was printed in 1720.

The third of the rarer books alluded to is a copy of the whole Eliot Bible of 1685, an elaborate description of which, based on fifty-five copies known to Pilling, appears in the *Bibliography of the Algonquian Languages*. This newly discovered copy has been acquired by Mr William Wallace Tooker, of Sag Harbor, Long Island, and while not perfect, it is as nearly complete as twenty-six of the copies hitherto known. Many marginal notes in Indian, with the names of several Indian owners, make the book of special interest. For sixty-five years

the bible has been stored away in a chest in a garret. Notwithstanding the fact that of this edition of the Eliot Bible more than half a hundred copies exist, it has always been in great demand by bibliophiles, one purchaser having paid the sum of $950 for his copy.

F. W. HODGE.

Oriental Influences in Mexico—Some time ago Dr Edward Palmer collected for the National Museum a Mexican rain-coat of palm leaf, called in Mexico "*China capote de palma.*" The collection of rain-coats in the National Museum numbers about a score of specimens from China, Japan, and Mexico. Lately these rain-coats were laid out for comparison, under the impression that the Mexican style of this garment might be of Chinese origin. The result of the examination confirms the impression, and it is hoped that later the subject may be presented in detail. The word "*china*" is heard frequently in Mexico, applied, as a rule, to unusual or unfamiliar objects by all classes of the population. When it is recalled that the products of the Philippines were for centuries poured through Mexico to Spain, it would be strange if there were not many resulting traces of Eastern influences in Mexico. These influences may be looked for especially in introduced arts and plants. As an example of present conditions, there is a manufactory in the City of Mexico which employs over four hundred Chinese in making small articles, such as souvenirs, to be sold to tourists.

WALTER HOUGH.

Gabriel de Mortillet—The scientists of Europe are mourning the loss of one of their most active collaborators, distinguished alike as an archeologist, zoölogist, and geologist. Gabriel de Mortillet, whose long and industrious career came to an end September 23d, was born at Meilan, Department of Isère, France, in 1820, and was educated at Chambéry; his devotion to scientific pursuits commenced in early life, and he soon became distinguished as a naturalist; but it was as an archeologist that he achieved the most distinguished success. In 1864 he established a monthly magazine, devoted to the development of the primitive history of man, under the title *Matériaux pour l'histoire positive et philosophique de l'homme*, which in 1869 became *Matériaux pour l'histoire primitive et naturelle de l'homme*, under the editorship of MM. Trutat and Cartailhac. In 1890 the journal was united with the *Revue d'Anthropologie* and *Revue d'Ethnographie* and issued under the title *L'Anthropologie*. Mortillet took an important part in the explorations undertaken by Napoleon III. among the remains of the Gallic peoples as an aid to his studies for a Life of Julius Cæsar. These researches led to the establish-

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ment of a Gallo-Roman museum, to which Mortillet was attached and to which he devoted his energies until 1885, when he resigned in consequence of his election to the national legislature. He also took an active part in the proceedings of the Association Française pour l'Avancement des Sciences, the Société d'Anthropologie, and many congresses and meetings of anthropologists and archeologists. A memoir of his life, together with a bibliography prepared by his colleague Émile Cartailhac, is published in the September-October (1898) number of *L'Anthropologie*, Paris.

A. S. GATSCHET.

Korean Crossbow and Arrow-tube—The Koreans have a device for shooting short arrows with a bow, the draw of which is too long for the purpose. This device, hitherto undescribed, is called *saltong*, "arrow-tube," and consists of a tube of bamboo having a narrow strip removed throughout its length. One end of the tube is fastened to the wrist of the archer, the other end rests on the hand grasping the bow; the arrow is set on the bowstring with the head slanting into the slot, and tube and arrow are drawn back together. On the release of the string the arrow is discharged through the tube, and simultaneously the tube, having been drawn back past its support, falls down. There is a suggestion here as to the origin of the crossbow. The latter weapon is known to the Koreans, who call it *te-bak-sal*. It is a rapid-fire weapon, shooting four or five arrows in succession like the Chinese crossbow. The principal use of the crossbow was in war, although sometimes it was employed by hunters. The arrows were dipped in vegetal poison, the plant from which it was derived not being known to my informant, Mr Kiu Beung Surh.

WALTER HOUGH.

Among the Murray Islanders of Torres straits the only native numerals are *netat* (one) and *neis* (two). Any higher numbers would be described either by reduplication, *e.g.*, *neis netat*, lit. two-one for three; *neis-i-neis*, lit. two-two for four, etc., or by reference to some part of the body. By the latter method a total of thirty-one could be counted. The counting commenced at the little finger of the left hand, thence counting the digits, wrist, elbow, armpit, shoulder, hollow above the clavicle, thorax, and thence in reverse order down the right arm, ending with the little finger of the right hand. This gives twenty-one. The toes are then resorted to, and these give ten more. Beyond this number the term *gaire* (many) would be used; and if it was necessary to be exact, *kupe*, or tallies, would be used.—Hunt in *Jour. Anthrop. Inst.*, N. S., vol. I, p. 13, London, 1898.